DK

AVATAR

THE WAY OF WATER

THE VISUAL DICTIONARY

TULKUN

RONAL, *TSAHÌK* OF THE METKAYINA CLAN

K-BAR MK3 COMBAT/ UTILITY KNIFE

NEYTIRI

NEYTIRI'S BONE COLLAR

CRAB SUIT

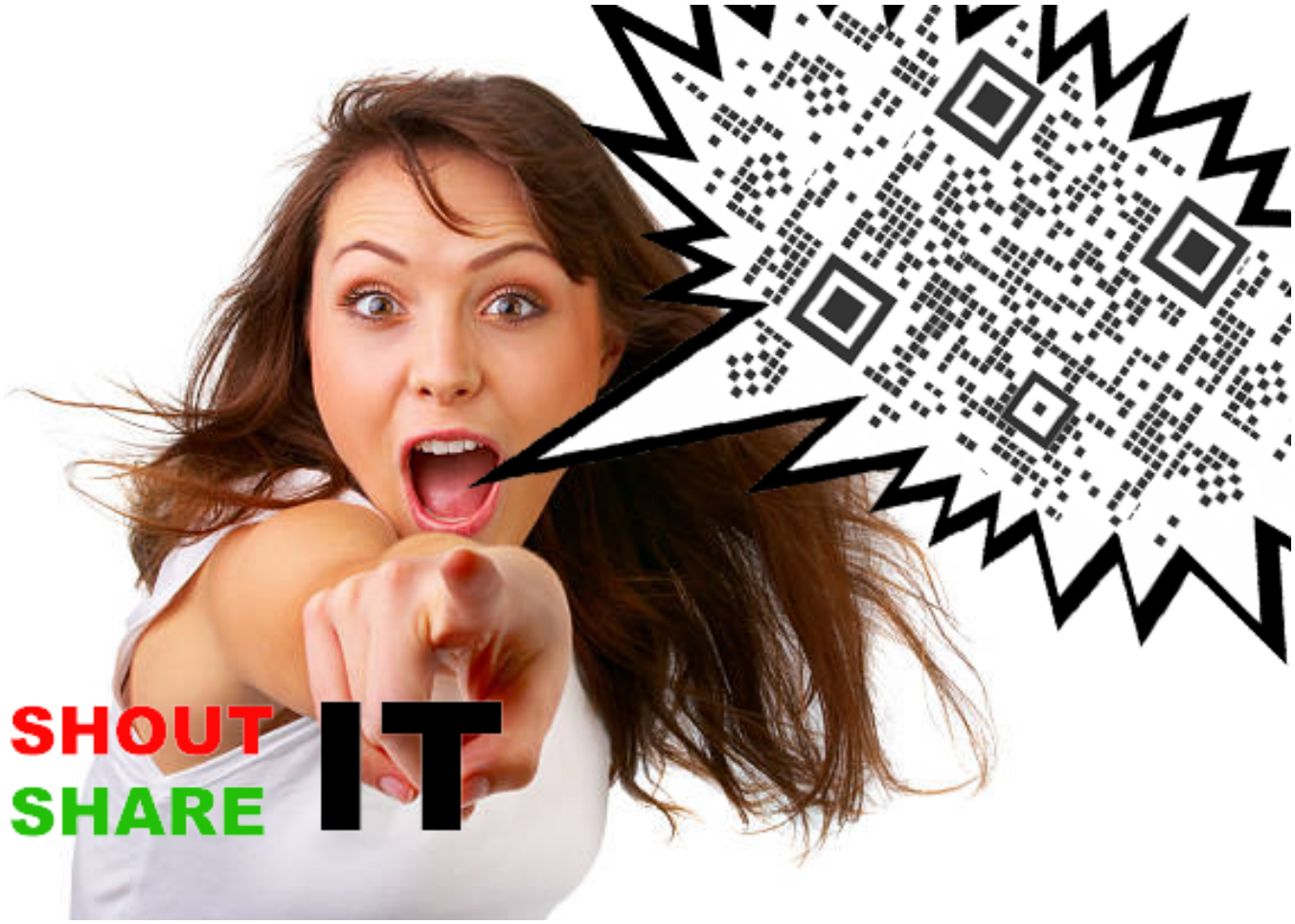
NETEYAM

SKIMWING

PANDORAN FRUIT BASKET

JAKE SULLY

HEXBOT HEAVY


SHOUT
SHARE
IT

AVATAR

THE WAY OF WATER

THE VISUAL DICTIONARY

NETEYAM

KIRI

AVATAR

THE WAY OF WATER

THE VISUAL DICTIONARY

Colors inspired by those found on the tsahik's clothing
Naturally twined razor palm and Pandoran flax
Leather and waxed thread from the fronds of a beanstalk palm
Dyed flax
Slinth fang
Sharpened river crystal

JAKE SULLY'S KNIFE | NEYTIRI'S KNIFE | NETEYAM'S KNIFE | LO'AK'S KNIFE | KIRI'S KNIFE | TUKTIREY'S KNIFE

BASED ON THE STORY, CHARACTERS, AND WORLD CREATED BY

JAMES CAMERON

WRITTEN BY

Zachary Berger, Dylan Cole, Joshua Izzo, Reymundo Perez, and Ben Procter

CONTENTS

FOREWORD 6
PANDORA 8

CHAPTER 1: THE SULLY FAMILY 10
JAKE SULLY 12
NEYTIRI 14
NETEYAM 16
KIRI 18
LO'AK 20
TUKTIREY 22

CHAPTER 2: THE OMATIKAYA CLAN 24
HIGH CAMP 26
MARUI 28
OMATIKAYA FOOD 30
OMATIKAYA ITEMS 31
SPIDER 32
DR. NORM SPELLMAN 34
HIGH CAMP BIOLAB 36
LINK BAY 38

CHAPTER 3: THE RDA 40
LANDING MODULE 42
INVASION FORCE 44
BRIDGEHEAD SATELLITE MAP 46
BRIDGEHEAD OPS CENTER 48
BRIDGEHEAD NEUROLAB BRAIN IMAGING BOOTH 50
SHIPYARD FACTORY 3D PRINTING 52
CONSTRUCTION 54
SWARM ASSEMBLERS 56
SKEL 58
GENERAL FRANCES ARDMORE 60
CAPTAIN MICK SCORESBY 62
DR. IAN GARVIN 63
GENERAL TECH 64

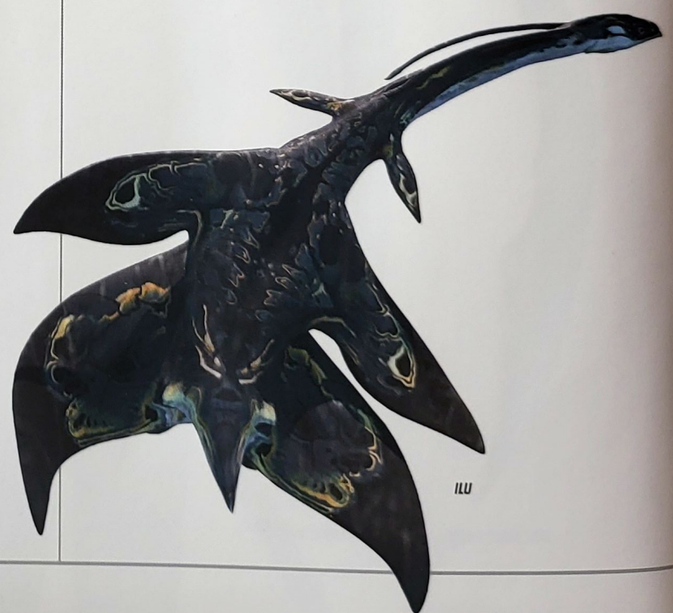
CHAPTER 4: THE RECOM PROGRAM 66
COLONEL QUARITCH 68
CORPORAL WAINFLEET 70
RECOM EQUIPMENT 72

CHAPTER 5: RDA VEHICLES 74
S-76 SEADRAGON 76
MATADOR 78
PICADOR 80
MAKO SUBMERSIBLE 82
CRAB SUIT 84
SEAWASP 86
KESTREL GUNSHIP 88

CHAPTER 6: THE METKAYINA CLAN 90
ATOLLS 92
METKAYINA VILLAGE 94
TONOWARI 96
RONAL 98
TSIREYA 100
AO'NUNG 102
METKAYINA CANOES 104
COVE OF THE ANCESTORS 106
THE SPIRIT TREE 108

CHAPTER 7: THE OCEAN 110
ANEMONES AND CORAL 112
ILU 114
SKIMWING 116
REEF FISH 118
GILL MANTLE 120
TULKUN 122
TULKUN CALVES 124

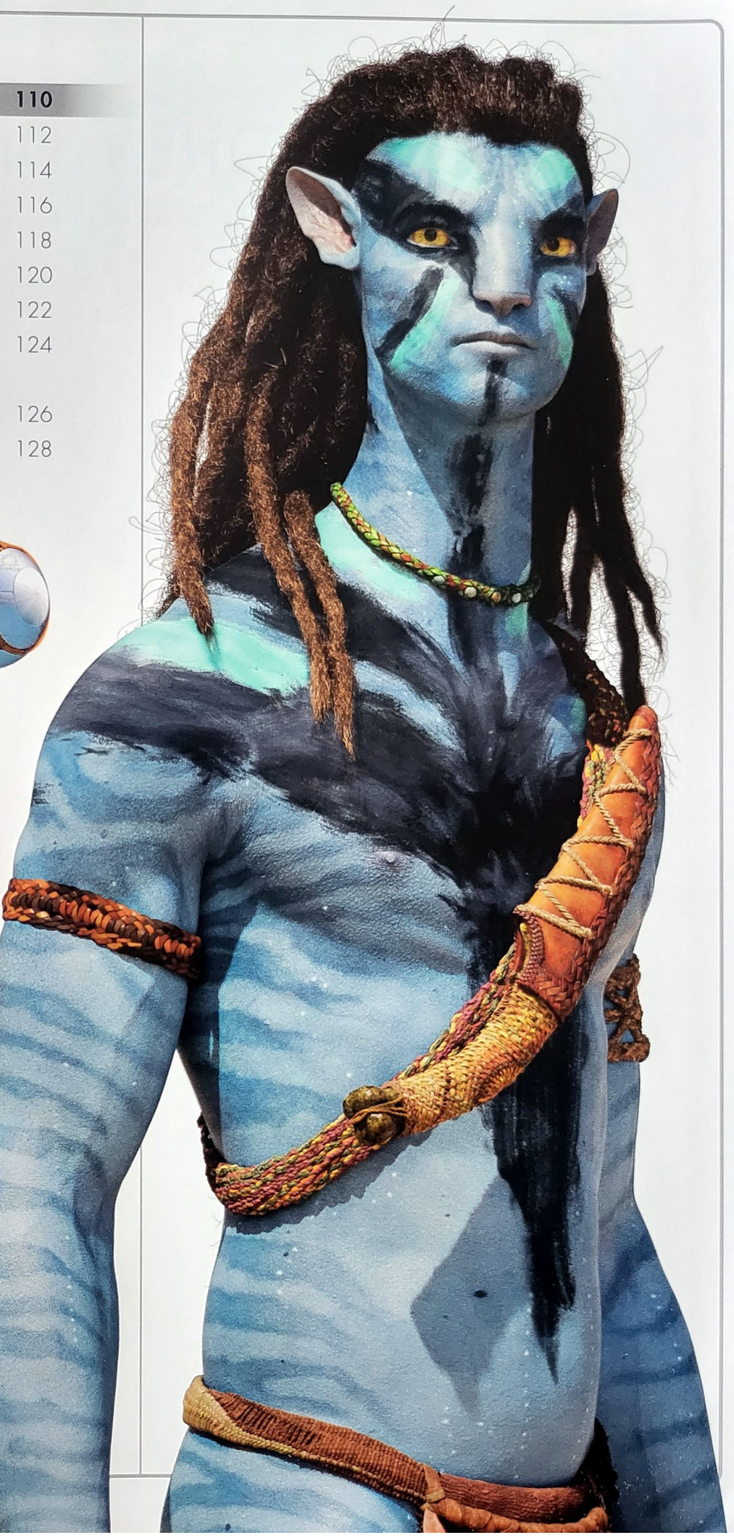
INDEX 126
ACKNOWLEDGMENTS 128



ILU

CONSTRUCTION BLIMP

CR-4 DIAGNOSTIC SYS



JAKE SULLY

FOREWORD

IN MY CAREER, I've been fortunate to have worked with some of the best and brightest filmmakers. I've portrayed characters from the distant past to the far-flung future and in all that time, one of the elements that creates and helps build an immersive performance for me is the *world* built by the filmmaker. A tangible, and sometimes intangible, universe is created through props and costumes, sets (both digital and practical), and with characters and creatures and all of the bits and pieces that go into making the fantastic and fictional… *real*.

In all of my time performing, I can say that no one that I've worked with has ever created a more "real" world than James Cameron, and this book is a testament to the universe he's created.

Through the talents of his massively skilled art department and the craftspeople at Wētā Workshop, Jim has populated Pandora with wholly believable cultures that could be featured in the pages of published magazines such as *National Geographic*. Every detail of this world has been crafted with a sensibility of what Jim refers to as "science-fact," not "science-fiction." The result is a reality of believability in everything on screen.

Having now been a part of multiple *Avatar* films, I know first-hand the exacting level of detail that Jim instills in everything that's seen on screen. He illustrates his boundless imagination and creativity at every turn. I'm constantly amazed at the new characters, diversity of Na'vi cultures, uniqueness of the flora and fauna, and overall beauty of Pandora that Jim is able to create.

This book showcases only a glimpse into the world of *Avatar*. The journey that I started as Dr. Grace Augustine has now become the journey of her daughter, Kiri. By revealing designs and details of just how incredibly rich and deep the world of Pandora can truly be, this book allows you to go on your own journey to Pandora.

This is only the beginning.

SIGOURNEY WEAVER

Dr. Grace Augustine / Kiri

PANDORA

THE FIFTH MOON of the gas giant Polyphemus, Pandora is similar in size, atmosphere, and appearance to Earth with continents and islands surrounded by seas of a familiar blue hue. Plant life is everywhere: forests and meadows cover much of the land, and rafts of floating seaweed dot the oceans. A wide variety of animals inhabit Pandora. Most of them are six-limbed, except for the humanoid Na'vi. The ecology among all Pandoran creatures is delicately balanced, so Na'vi use the resources of their environment as efficiently as possible. This suggests a symbiotic relationship among all living things on the moon. The air is unbreathable to humans due to the excess carbon dioxide gas. But despite this, Pandora and its natural elements are of immense importance to the survival of humankind.

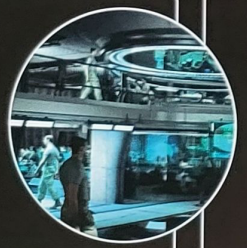
THE OMATIKAYA

The Omatikaya are a friendly and deeply spiritual clan of Na'vi that reside in a rainforest. They were the first Na'vi to have contact with humans on Pandora. Also known as the "Blue Flute Clan," the clan are noted weavers recognized for their beautiful textiles and woven structures. They are also proud warriors and protectors of their home and way of life.

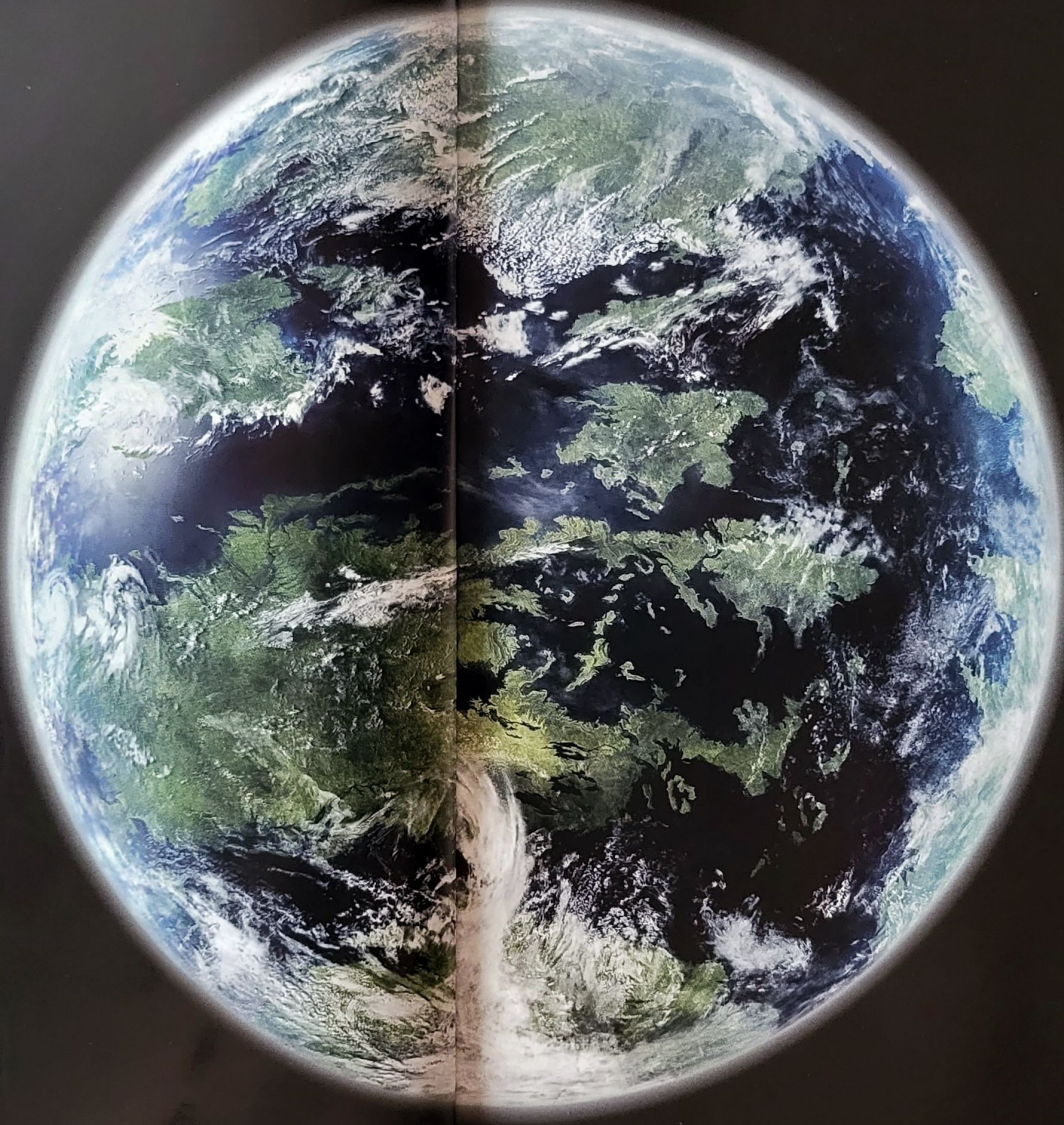
THE METKAYINA

The Metkayina are one of the sublittoral Na'vi cultures, known as "Reef People," that live along coastal reefs, barrier reefs, and atolls. Their tranquil island home is protected from the wild ocean by a natural seawall. Although Metkayina history is rife with conflict and hardships, the clan has learned to live peacefully and simply in harmony with their ocean biome.

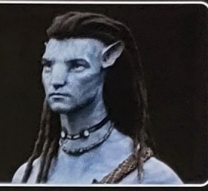
THE RDA



The Resources Development Administration (RDA) is a giant corporation with many subsidiaries that dominates all off-Earth mining and development throughout the Sol and Alpha Centauri systems. The RDA has monopoly rights to products shipped, derived, or developed from locations like Pandora. Subsidiaries include power utilities, manufacturing, defense, and pharmaceutical companies.



JAKE SULLY
Olo'eyktan (chieftain) of the Omatikaya clan, Jake is known as *Toruk Makto*, Rider of the Last Shadow, who drove the RDA from Pandora 15 years ago.

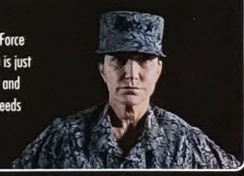


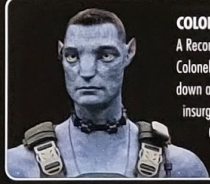
NEYTIRI
Tsakarem (spiritual leader in training) of the Omatikaya clan, Neytiri is also one of the fiercest warriors Pandora has ever known. She was instrumental in beating the RDA.

TONOWARI
Olo'eyktan of the Metkayina Clan, Tonowari oversees the well-being of his community on the reef. His clan respects him for his ideals and his ability to lead.

RONAL
Tsahik of the Metkayina Clan, Ronal is responsible for the spiritual needs of her people, but is also a warrior who is willing to put everything on the line to protect them.

GENERAL ARDMORE
The RDA's new Expeditionary Force Commander, General Ardmore is just the kind of on-world manager and military leader that the RDA needs for their return to Pandora.





COLONEL QUARITCH
A Recombinant (Recom) soldier for the RDA, Colonel Quaritch is on a mission: to hunt down and kill Jake Sully, leader of the Na'vi insurgency and traitor who betrayed both Quaritch and all of humanity.

CHAPTER 1:

THE SULLY FAMILY

With the Battle of the Hallelujah Mountains now a distant memory, Jake Sully and Neytiri are living a life of peace and happiness. Family life suits them, and they now have four children. Neteyam is their first son, born soon after the expulsion of the RDA. Their middle son, Lo'ak, is a year younger, a self-perceived underdog who feels like he doesn't live up to his legendary parents and Neteyam's standing in the Omatikaya. Tuktirey (Tuk) is their youngest child; she is an independent and opinionated youngster who has to grow up fast. Neytiri and Jake have also adopted Kiri, who was mysteriously born of Dr. Grace Augustine's dormant avatar. This close-knit family is learning to adapt to survive the return of the RDA and its ramifications for their world.

JAKE SULLY

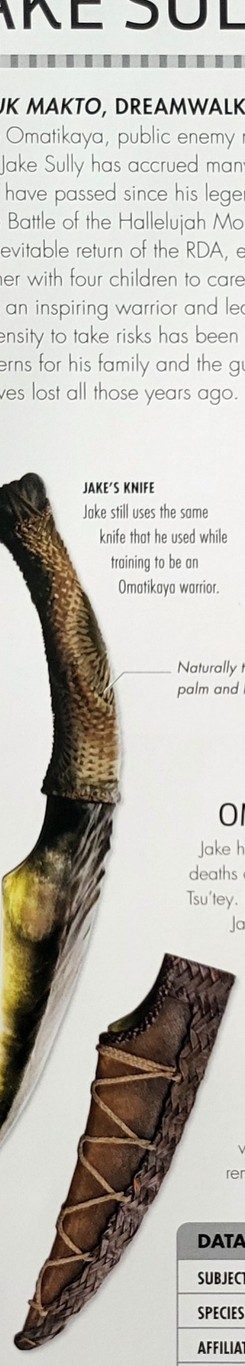
***TORUK MAKTO*, DREAMWALKER,** *olo'eyktan* of the Omatikaya, public enemy number one of the RDA: Jake Sully has accrued many titles. Fifteen years have passed since his legendary victory at the Battle of the Hallelujah Mountains. Jake fears the inevitable return of the RDA, especially as he is a father with four children to care for. While Jake is still an inspiring warrior and leader, his propensity to take risks has been tempered by concerns for his family and the guilt he feels for the lives lost all those years ago.

JAKE'S KNIFE
Jake still uses the same knife that he used while training to be an Omatikaya warrior.

Naturally twined razor palm and Pandoran flax

Waxed, braided leather thread

BATTLE ARMBAND



JAKE'S KNIFE SHEATH

OMATIKAYA OLO'EYKTAN

Jake has held the mantle of *olo'eyktan* since the deaths of *Olo'eyktan* Eytukan and his successor, Tsu'tey. Responsible for the safety of his people, Jake uses his human background to bring a unique perspective to the role. For example, he has forbidden his clan from finding a new Hometree, knowing it would be a target for the RDA. Jake also draws on his diplomatic skills to try to reconcile the Omatikaya and humans. As a result, the Omatikaya build a village near Hell's Gate where the remaining humans on Pandoran live.

DATA FILE
SUBJECT Jake Sully
SPECIES Avatar (previously human)
AFFILIATION Omatikaya
HEIGHT 8 ft 11 in (2.72 m)

Riding their *ikran*, Jake, Neytiri, and Neteyam fly among the Hallelujah Mountains.

FACT FILE

> Jake is trapped between two worlds. He tries to avoid using human technology, but he knows that when the RDA return he must use his rifle again to protect The People.

Hand-carved ax head

BATTLE CHOKER
Jake continues to wear the necklace made from river stones during his training with Neytiri.

Leather from Jake's first sturmbeest hunt

JAKE'S TOMAHAWK

Customized tomahawk better suited to Jake's Avatar body

Fifteen-year-old model

Leather wrist wrap

A TOUCH OF TECH
In order to communicate with Neytiri and his children, Jake wears an Avatar (AVTR) Program throat comms array with earpiece.

A NEW LIFE

Willingness to prioritize the safety of his people over that of himself and his family is typical of Jake. When the RDA return to Pandora he must make some hard decisions. Believing that RDA forces are hunting him, Jake makes the tough decision to leave the Omatikaya in the relative safety of High Camp, a base hidden within the floating mountains, and start a new life far away with the reef-dwelling Metkayina clan. Whether or not the Sullys will be accepted by their hosts could depend on Jake's well-honed skills in diplomacy.

Assault rifle magazines stored in pouches

Telescopic sight

MODIFIED SKEL M69 ASSAULT RIFLE

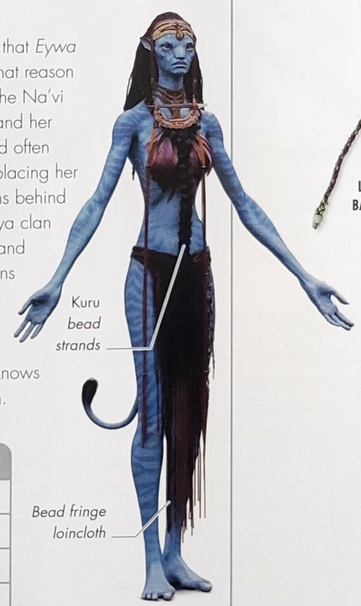
Skel AR stock replaced with a wooden one

NEYTIRI

NEYTIRI IS MANY THINGS: a strong warrior, a highly skilled healer, and a proud mother. While she misses being the carefree adventurer of her youth, she appreciates that she now has a bigger calling. Jake and Neytiri's lives revolve around the responsibility they have to the Omatikaya clan. Following the Battle of the Hallelujah Mountains, the pair are heroes to the Omatikaya, and their world is a constant quest to find balance between the rainforest settlement of the Na'vi and the human settlement of Hell's Gate. The Omatikaya know how much pressure the couple are under in dealing with the humans at Hell's Gate, rebuilding the clan, and preparing for the RDA's return.

SPIRITUAL GUIDE

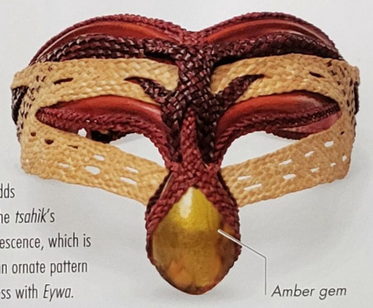
Neytiri's mother, Mo'at, is confident that *Eywa* has a plan for the Omatikaya. For that reason she is willing to consider adapting the Na'vi way of life. Mo'at does not understand her daughter's resistance to change, and often sides with Jake Sully in arguments, placing her faith in his leadership. Mo'at remains behind with Norm, Max, and the Omatikaya clan at High Camp when Jake, Neytiri, and the children leave for the reef. It pains her to see her daughter and family leave, but she knows, as *tsahik*, that her place is with the people. She does not know when, but she knows that she will see her daughter again.



MO'AT

DATA FILE

SUBJECT	Mo'at
SPECIES	Na'vi
AFFILIATION	Omatikaya
HEIGHT	8 ft 7 in (2.62 m)



AMBER HEADBAND
The amber gem adds totemic value to the *tsahik*'s forehead bioluminescence, which is believed to have an ornate pattern due to her closeness with *Eywa*.

LEG BAND

A NEW WORLD

Adapting does not come naturally to Neytiri. She has a really hard time getting used to the Sullys' new reef biome and learning the Way of Water from their hosts. The reef is completely different from the only world she has ever known—the forest. There, she was certain of the environment, her place within it, and her legendary skills.

TSAKAREM

Each clan has a *tsahik*, who is the keeper of the wisdom of herbs and sacred plants, conductor of sacred rituals, healer, and interpreter of the will of *Eywa*. Neytiri is next in line to become *tsahik* and is learning from her mother, Mo'at, who currently occupies the role. Normally, the first-born child of a *tsahik* inherits the role. As the second-born, Neytiri is still adjusting to the idea of being *tsakarem* (*tsahik* in training), following the death of her sister, Sylwanin. Neytiri has found solace in her deepening love for *Eywa*. While Neytiri presides over some ceremonies and has some official duties, her mother will remain the clan's *tsahik* until Neytiri is ready.

***IKRAN*-RIDING VISOR**

BONE COLLAR
Neytiri wears this bright and colorful top during raids on RDA trains.

FACT FILE

> It is customary among the Na'vi to mourn for some time after the passing of their *ikran*. Neytiri did so, after the death of her *ikran* Seze.

> Neytiri's views clash with some of Jake's. She opposes his view that Na'vi should be armed with the weapons of the Sky People.

ARMBAND

ORNAMENTS
Armbands, bracelets, cuffs, and decoration all form part of Neytiri's wardrobe. Some are holdovers from her Omatikaya wardrobe, while others are new from the Metkayina people.

BEADED CUFF

REEF STYLE
The Sullys' heavy rainforest clothing is unsuited to life on the reef. Their new home demands lighter and more biome-appropriate garb, like that worn by their Metkayina hosts. Neytiri retains some of her signature style while leaning into the marine bird leathers and reef flowers that make up the reef people's clothing.

KNIFE
Neytiri's knife has remained the same since childhood. It is made from obsidian and honed to a razor edge.

DATA FILE

SUBJECT	Neytiri
SPECIES	Na'vi
AFFILIATION	Omatikaya
HEIGHT	8 ft 7 in (2.62 m)

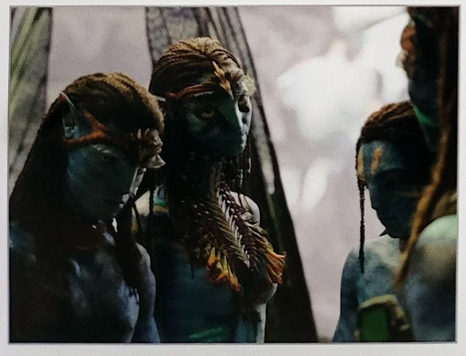
NETEYAM

STRONG AND CONFIDENT, Neteyam te Suli Tsyeyk'itan is the eldest child of Neytiri and Jake Sully. He is favored by the clan as he is a natural athlete and hunter like his mother and noble like his father. When Jake and Neytiri must leave the younger children, they look to Neteyam to look after his siblings. He cares greatly for them, and while competitive with his younger brother, Lo'ak, he supports them all so they can succeed and shine. Neteyam holds himself to an incredibly high standard. In the same way that his brother lives in his shadow, Neteyam lives in the shadow of his father. He is always trying to prove his worth to Jake and ensure that his father recognizes his achievements and accomplishments.

DATA FILE	
SUBJECT	Neteyam
SPECIES	Na'vi
AFFILIATION	Omatikaya
HEIGHT	8 ft 2 in (2.62 m)
AGE	15 years

***IKRAN* RIDING VISOR**

BEADED CHOKER



Neteyam is relied on by his parents, and he often accompanies them on missions.

ARROW

BOW AND ARROW
An expert at archery, Neteyam was the youngest Omatikaya to make a clean kill at the sturmbeest hunt.

Bow made from the wood of the fallen Hometree

ARMBAND

WARRIOR CHILD

Neteyam excels at all things. His hunting prowess is nearly unmatched among the other young members of the Omatikaya clan, and his *ikran* flying is almost as good as his mother's. He wears the warrior's cummerbund of the Omatikaya proudly and strives to set an example for all of his siblings.

Throat comms allow communication with his siblings

Omatikaya cummerbund

Leather armguard

Leg guards worn while riding an ikran or a direhorse

Turquoise pebbles

WOVEN CHOKER
Neteyam brings his woven choker with him to the reef. He made this important item in the classic style worn by generations of storied Omatikaya warriors, like Tsu'tey.

Bead representing the first lullaby that Neteyam remembers being sung to him

SONGCORD

Omatikaya knife crafted with leather and waxed thread from the fronds at the top of a beanstalk palm

OMATIKAYA KNIFE

BRAIDED ARMBAND

RISE TO THE CHALLENGE

With confidence and social skills in abundance, Neteyam forges a bond between the Sully children and the Metkayina kids and opens the way to friendly relations between the adults. Neteyam does all he can to ensure he, Lo'ak, Kiri, and Tuk don't aggravate the Metkayina.

KIRI

KIRI TE SULI KÌREYSÌ'ITE is an inquisitive and fiercely intelligent Na'vi who is a beloved daughter of Jake Sully and Neytiri. Her origins are shrouded in mystery. Not long after Grace Augustine's death, her dormant avatar was discovered to be pregnant, and Jake and Neytiri decided to adopt the child when she was born.

Unkempt hair, a hallmark of being an explorer
Grace Augustine's necklace that Kiri always wears to remain close to her mother
Inspired by the eye of Eywa
Fish-skin leather loincloth
Natural color marine algae

SPECIAL MEANING

The Omatikaya only create articles of clothing that are meaningful to the wearer. The pieces are often crafted by the individual for themselves or for someone they care about. It is very rare that they make clothing that they intend to trade.

NECKLACE

SHAWL

METKAYINA ARMBAND

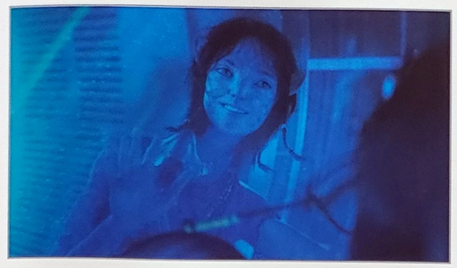
BRAIDED REEF TOP

STATEMENT PIECES

Upper body garments usually carry some totemic value for the Na'vi. Whether it's a mantle representing their status in the clan, the silhouette of an animal's threat display communicating pride, or, as with Kiri, asymmetric patterns evoking nature, each individual makes a statement about their identity and how they contribute to their clan.

CHILD OF NATURE

Kiri is unlike any Na'vi or avatar the Omatikaya have ever encountered. From the earliest age she has had an unusually strong connection with *Eywa*—more than even that of a *tsahik*. She was able to bond with her *ikran* without even using the banshee *bola*. In fact, Kiri simply walked up to her intended *ikran*, locked eyes, and then it was over. The two were bonded and she made her first flight. While out in the rainforest, Kiri occasionally gets lost in thought and quiet meditation. Sometimes, on a task or errand, her siblings will notice that Kiri is missing. They often find her lying on the soft earth, eyes closed, feeling the pulse of *Eywa* under her.



In the High Camp Biolab, Kiri looks upon the dormant avatar of her mother, Dr. Grace Augustine. Kiri feels a connection to her even though they have never met.

GROWING UP

When Kiri was old enough, she was adopted. She feels a kinship to the Sully family, because they raised her, yet also a feeling of being set apart. A dutiful sister, Kiri takes care of her younger siblings, especially Tuktirey, but when possible she will leave them for a moment and go to the Biolab to visit with her biological mother. Kiri will watch old videolog footage of her and talk softly to the dormant avatar behind the glass, trying to understand her own place in the greater world.

MEDICINE POUCH

Kiri is never far from her medicine pouch. This treasured object used to belong to her adoptive mother.

Contains healing herbs for Kiri to use on her siblings

KNIFE AND SHEATH

Whether it be for cutting medicinal plants or removing splinters, Kiri never leaves the village without her knife.

Fashioned from the dart beak of a slinger animal

Adorned with feathers and leaves that Kiri has collected and updated over time

NA'VI TOP

BOTANY STUDENT

Inspired by Grace Augustine, Kiri is something of a botanist herself. She is always learning about plants and adding what she discovers to her clothing, so that she may describe them to others who become curious.

FOREST ARMBAND

Each bead is a pebble from an area that Kiri visited or discovered for herself for the first time

ANKLET

DATA FILE
SUBJECT Kiri
SPECIES Na'vi
AFFILIATION Omatikaya
HEIGHT 7 ft 7 in (2.32 m)
AGE 14 years

LO'AK

SECOND SON OF Jake and Neytiri, Lo'ak te Suli Tsyeyk'itan has grown up feeling like an outsider in his own family, and in the Omatikaya clan at large. He feels different from his siblings Tuk and the golden child Neteyam. He has four fingers (instead of the usual Na'vi three), and he is considered more human than Na'vi by many. Hotheaded, brash, and impulsive, Lo'ak reacts by rushing into his experiences, trying to immediately rise to the level of his older brother. Lo'ak's closest sibling and confidant is his sister Kiri. They have become fast friends with the human boy Spider, and have found solace in each other's company as they have grown up together.

Ikran claw

NECKLACE

Made from sharpened river crystal

HUNTING KNIFE

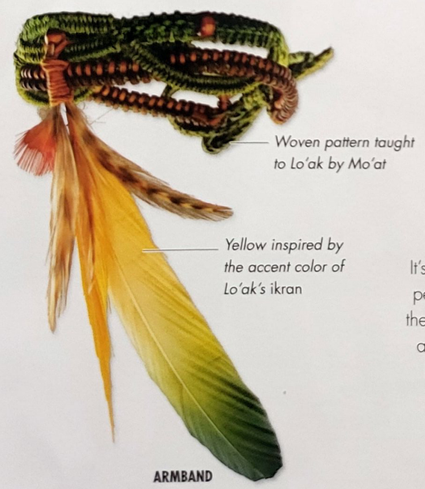
Hexapede hide

KNIFE SHEATH

ARMGUARD

YOUNG HUNTER

Lo'ak has not gone through his *uniltaron* ("Dream Hunt") yet, so he does not wear the typical Omatikaya cummerbund.



Woven pattern taught to Lo'ak by Mo'at

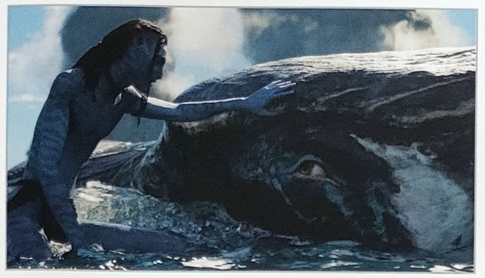
Yellow inspired by the accent color of Lo'ak's ikran

ARMBAND

IN THE SHADOWS

It's difficult growing up surrounded by perfection. Lo'ak struggles to deal with the looming shadow of not only his heroic and legendary father, Jake Sully, but also his older brother, Neteyam—the golden child of the Omatikaya clan.

Unlike most Na'vi, Lo'ak has eyebrows, like his father



Lo'ak has always identified with outcasts. After becoming lost at sea, Lo'ak is befriended by a *tulkun* named Payakan, who helps Lo'ak rejoin his family.

FACT FILE

> Lo'ak is a constant companion to Kiri, who is also judged by others for her differences. However, she is a strong example to Lo'ak of how not to let others' judgments make them feel ashamed and unworthy.

DATA FILE

SUBJECT	Lo'ak
SPECIES	Na'vi
AFFILIATION	Omatikaya
HEIGHT	7 ft 7 in (2.32 m)
AGE	14 years

Wooden beads

BEADED NECKLACE

Woven bracelet with a wooden band

BOW AND ARROW

Largest stone was gift from Tuktirey

POLISHED RIVER STONE HAIR BEADS

NEW ATTIRE

Lo'ak has swapped out his Omatikaya loincloth for one he made with the Metkayina, in part for ease of swimming and in part because of his growing connection with the reef. However, his knife and sheath are still carried on his person, and they serve him well in hunting and daily chores with the Metkayina people.

A FRESH START

On the reef, Lo'ak discovers an environment in which he can thrive. He may be a forest Na'vi, but he truly shines in the ocean and is able to define himself in ways he couldn't before. Under Tsireya's tutelage, Lo'ak excels at the various new skills, picking up breath-hold diving, swimming, ocean hunting, and *ilu* riding with ease. To his delight and surprise, he's even better than Neteyam. The only thing he's not especially good at is staying out of trouble.

Bead memorializes the day when the Sky People arrived

ARMBAND

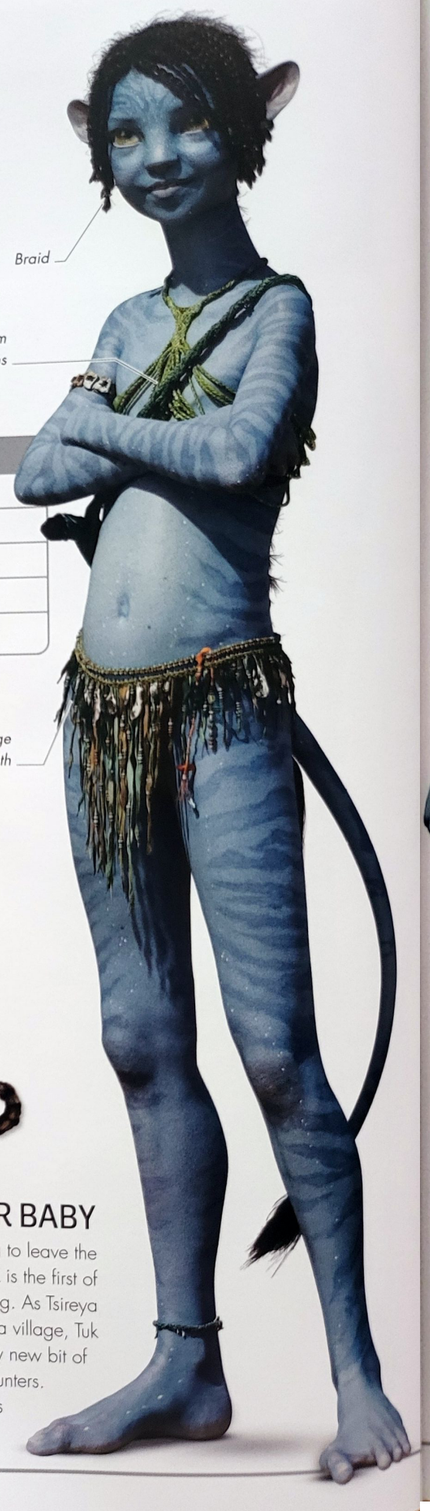
SONGCORD

TUKTIREY

PRECOCIOUS AND ALWAYS UNDER FOOT, Tuktirey te Suli Neytiri'ite, nicknamed "Tuk-Tuk" or "Tuk," is Jake and Neytiri's youngest child and was born in 2163. She has a particular habit of always finding herself in places where she shouldn't be. The baby of all the Sully children, she's the little kid her older brothers try to shake off. Tuk-Tuk is independent and demanding, forcing herself to be listened to among the older ones.

Pattern inspired by the energy that flows through trees

BRAIDED TOP
Tuk assisted Neytiri by braiding some of the strands for the top.



Woven and crafted by Jake as a gift

SHELL ARMBAND

TUK'S SONGCORD
A Na'vi child's songcord is short in length given their young age. But should an individual ask to hear it sung aloud, the song is surprisingly long. Often, the songs are packed with thrilling stories and grand adventures. However, the child's parents may sing a different version, perhaps closer to the truth.

WATER BABY

Although initially saddened by having to leave the safety and comfort of the rainforest, Tuk is the first of the Sully children to adapt to reef living. As Tsireya shows the children around the Metkayina village, Tuk is delighted and surprised by every new bit of exotic ocean flora and fauna she encounters. She is particularly fond of the *ilu* ponies that live near the pelagic Na'vi.

DATA FILE
SUBJECT Tuktirey
SPECIES Na'vi
AFFILIATION Omatikaya
HEIGHT 5 ft 7 in (1.7 m)
AGE 7 years

Tuktirey is endlessly fascinated by the world beneath the waves, especially all of the amazing fauna, like these glider fins.

POSITIVE SPIRIT

Having grown up in the forest next to the humans at Hell's Gate, Tuk is used to experiencing cultures other than her own. For that reason she quickly bonds with the Metkayina, blending in easily with the other reef kids. Young Tuk is full of boundless love and completely open to the world.

ANKLET

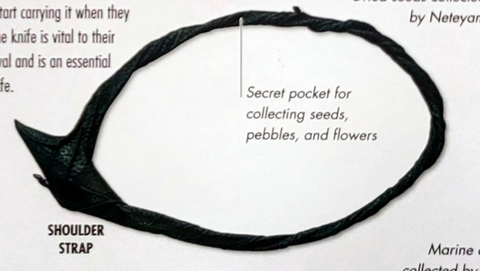
METKAYINA ANKLET

CHILDREN'S JEWELRY
Bracelets and bands with beads and trinkets are among the first items that Omatikaya children weave. The materials can be passed down to them or found in the jungle while at play. Over time, the items may make their way to the child's songcord or be added to other garments as they grow older.

ARMBAND

Purple color, like that of a direhorse, suggested by her best friend, Popiti

BLACK CRYSTAL KNIFE
The knife is the most important tool for a Na'vi. They start carrying it when they are children. The knife is vital to their everyday survival and is an essential part of their life.



SHOULDER STRAP

SHELL FRINGE LOINCLOTH
Tuk's siblings know that she is excited by Metkayina culture, so they commemorate her experience by making a reef loincloth for her.

FACT FILE

> Tuk, like Neteyam, has the typical Na'vi three-fingered hand.

> Since Tuk is too small to bond with her own *ikran*, she rides as a passenger whenever there is a need to fly.

CHAPTER 2:

THE OMATIKAYA CLAN

After the fall of Hometree and the expulsion of most of the humans on Pandora, the Omatikaya clan formed a new settlement on the outskirts of Hell's Gate. The clan's new village is a group of Na'vi *marui*. When the dreaded day comes that the Sky People return to Pandora, the Omatikaya leader, Jake Sully, and the remaining clan members make the difficult decision to leave the rainforest. They seek shelter within a concealed cave system located in the Hallelujah Mountains, from which they regularly conduct raids on the RDA infrastructure and supply lines.

HIGH CAMP

A HIGHLY DEFENSIBLE cave system inside Mons Veritatis, a large floating mountain in the Hallelujah range, High Camp is a Na'vi stronghold that clan leader Jake Sully has designated as a place his people will retreat to if they need to hide from the returning RDA forces. The main grotto is entered not horizontally but vertically, by *ikran* flying up through a large crevasse in the floor. Later, it becomes the guerrilla base camp, and is equipped with a link shack and a science shack to support avatar as well as Na'vi activity. While High Camp is a last refuge, it also becomes a true home for the humans and Na'vi who live there side by side. With high technology and indigenous living placed in such close proximity, the tight quarters at High Camp actually enhance the resistance group's sense of community and combined culture.

HIDDEN REFUGE

The grotto that would become High Camp is hidden deep in the Hallelujah Mountains. When Jake discovered it, he knew it offered a unique hiding place from the RDA. With its natural entrances tucked beneath a great floating mountain, the grotto and its adjacent chambers are invisible to the prying eyes of RDA orbital imaging assets. Jake's flyers can come and go from High Camp totally undetected, provided they exercise the correct formation discipline. As such, this stony aerie makes a formidable base of operations for raids on RDA installations and assets, which Jake can hit hard before seemingly vanishing. Needless to say, pinpointing High Camp is high on the frustrated RDA's list of priorities.

DATA FILE

NAME	High Camp
LOCATION	Hallelujah Mountains
TERRAIN	Uneven rocky surfaces in cave system
POPULATION	Human and Na'vi

SOCIAL SPACES

High Camp contains a campfire and several community spaces that provide opportunities for leaders to speak and allow the Omatikaya and their human allies to socialize together. Nothing bonds a group like hardship and a common purpose, so it comes as no surprise that deep friendships are nurtured at High Camp.

AVATAR LONGHOUSE
These marui shelter avatar bodies, providing sleep hammocks and medical support.

BIOLAB
These inflatable structures house medical, research, and link functions.

FACT FILE

- Campfires and Na'vi blankets convert damp cave floors into comfortable spaces. Dwellings are modular and lightweight so they can be moved in a hurry.
- Structural ropes for *marui* dwellings are anchored not only to cave walls but to small floating rocks, which also support power cables and lighting.

STOWED KIT

AR CLEANING KIT
Maintaining weaponry under field conditions for years on end is not easy, but Jake and his rebels manage with the help of custom cleaning kits. This one is geared toward the Skel AR.

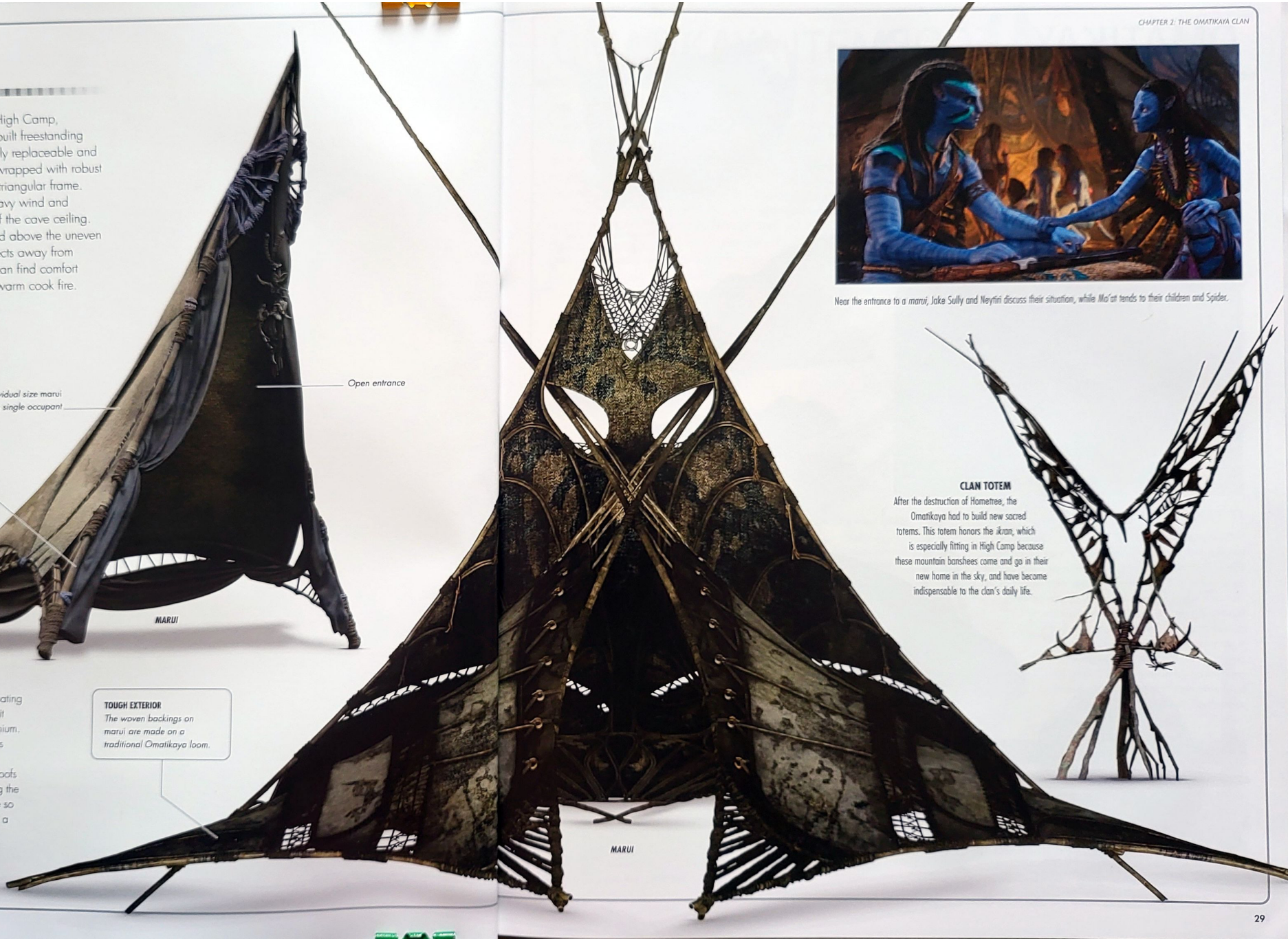
MARUI

IN THE OPEN-FLOOR CAVE known as High Camp, Omatikaya families and individuals have built freestanding woven structures called *marui* that are easily replaceable and repairable. They are made of wicker ribs wrapped with robust lashings overlaying a compound curve or triangular frame. The exterior of the *marui* can withstand heavy wind and provides protection from water dripping off the cave ceiling. Inside, individual hammocks are suspended above the uneven rock surface in order to keep crawling insects away from sleeping Na'vi. While awake, the Na'vi can find comfort sitting together on a woven mat next to a warm cook fire.

CAVE ENCAMPMENT

High Camp is situated inside one of the biggest floating mountains in the Flux Vortex, a space so large that it contains weathered-out deposits of floating unobtanium. The rocks are flux-pinned, which means they always maintain their position due to magnetic force. The Omatikaya use the rocks to tie up and tension the roofs of their *marui* with rope. The human loyalists sharing the cave use the rocks to affix electric lights from above so that they can see in the dark. These lights illuminate a tableau of Na'vi and human encampments with an overlap zone of advanced technology and Omatikaya equipment.

TOUGH EXTERIOR
The woven backings on marui are made on a traditional Omatikaya loom.



Near the entrance to a *marui*, Jake Sully and Neytiri discuss their situation, while Mo'at tends to their children and Spider.

CLAN TOTEM
After the destruction of Hometree, the Omatikaya had to build new sacred totems. This totem honors the *ikran*, which is especially fitting in High Camp because these mountain banshees come and go in their new home in the sky, and have become indispensable to the clan's daily life.

OMATIKAYA FOOD

THE OMATIKAYA PRIDE themselves on their ability to prepare meat, vegetables, fruit, seeds, and spices in a myriad of combinations. The ingredients can be diced, mixed, and served on a leaf plate coated in natural oils and salt, or rolled up in an edible leaf and vine wrap called *nikt'syey*. These traditional food preparations can be eaten while hunting and gathering or at home among family. The meals are nutritionally balanced, and the animal that gave its life is only taken for the good of the clan and the Pandoran ecosystem.

IT TAKES A VILLAGE

While nurturing their babies, Omatikaya parents may prepare and eat meals separately from the clan gathering space. This enables them to promote better sleep for their child and to tend to them quietly when they wake up. The clan as a whole supports the family by offering them baskets of fruits and vegetables they've collected as well as protein from their hunts. The family is not expected to give anything in return; only to ensure that their children grow up as strong and healthy as possible in order to be able to contribute to their clan's overall survival into the next generation.

Yovo fruit

FRUIT BASKET
Pandoran fruits are often collected in woven baskets made from willowlike rods and twine.

Mushroom steak served with fruit and wind-dried mucilage traded seasonally from a nomadic clan

PLANT-BASED DISH

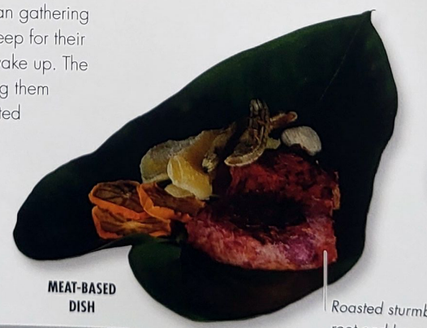
Edible button octoshroom

MEAL SERVED ON SPARTAN PLANT LEAF

Leopard palm fruit has taste described as buttery orange

Antioxidant baby squid fruit with leaves

CHOPPING BOARD



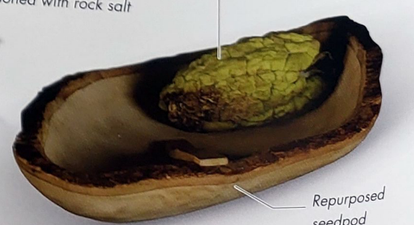
MEAT-BASED DISH

Roasted sturmbeest served with hex root and beanpod potato over citrus and grain seasoned with rock salt

Skin can be left on for cooking

PANDORAN ROOT VEGETABLE

Utu mauti (banana fruit)



Repurposed seedpod

FRUIT BOWL

FACT FILE

> The Omatikaya teach food preparation skills to their children through social songs with rhythmic accompaniment.

> A style of song that works with food-oriented group tasks is heterophony—where a performer sings the same basic melody as the others, but joins in at different points, with different tempos and rhythms, adding textures and layers as they would with their meals.

OMATIKAYA ITEMS

THE OMATIKAYA BUILD practical items and tools for everyday survival, totemic storytelling, and enjoyment. They use sustainable materials from the rainforest such as wood, minerals, gourds, reeds, and plant leaves, as well as animal hide, bone, and claws. As expert weavers, the clan also integrates patterns into their woven items, emulating what they see in nature: a complexity with a higher mathematical order. In general, rather than rigid 90 degree lines or grids, the Omatikaya weave and form in an holistic and organic way, with rounded edges, sacred spirals, and labyrinth-like patterns.

Tongue indicates animal is docile herbivore

Exterior tie based on primary color of animal's skin

HEXAPEDE TOY
The Omatikaya encourage their children to make crafts based on animals they see in the forest in order to help better understand their forms and functions.

Interior tie based on secondary color accent of animal's skin

NA'VI MAT

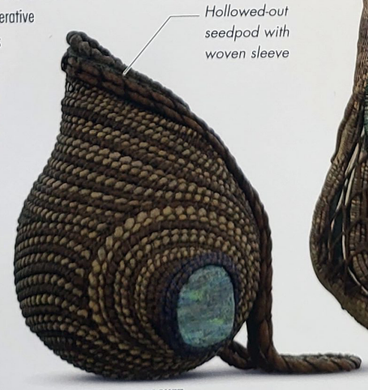
HAMMOCK

CRAFT MAKERS

All members of the Omatikaya specialize in at least one craft-making skill. One Na'vi may be an expert in braiding tight bow strings while another can stitch leather to form a saddle. Through combined individual efforts, the Na'vi contribute to each other's resources, forming a cooperative system and clan bonding that has sustained the Omatikaya for tens of thousands of years.

Inner lining made from water-resistant animal skin

Hollowed-out seedpod with woven sleeve



BASKET

WATER CARRIER

Snapped stem of gourd

TEA CUP

TEA STIRRER

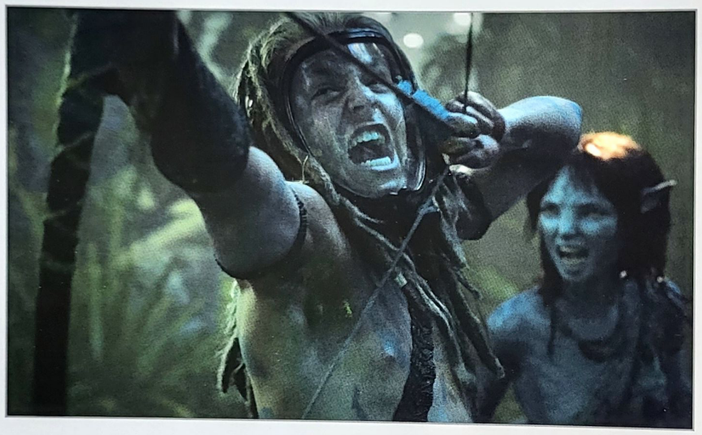
BASKETS AND CARRIERS

Simple, functional baskets and carriers are often decorated, both to honor the natural world and also to display the maker's pride in their work. The items are mostly used in conjunction with a head or shoulder strap.

SPIDER

MILES SOCORRO PREFERS BEING called by his nickname, "Spider." He gained this moniker due to his natural proclivity to climb, which he first exhibited as a baby. Both of his parents were killed during the Battle of the Hallelujah Mountains, and he was too small to be sent back to Earth in cryostasis. Miles remained on Pandora and was fostered by a human family at Hell's Gate that Jake allowed to remain. As Spider grows up, he starts tagging along with the Sully children on their adventures. This willful teenager has a big heart and a desire for adventure.

Captured by the recoms, Spider is taken to Bridgehead City and interrogated by Quaritch.



FRIEND OF THE FAMILY

Spider wishes for nothing more than to be a Na'vi and to run and live free in the rainforest. He's spent his life following in the ever-growing footsteps of the Sully children, and he tries his best to emulate their lifestyle—and their looks. He's grown his hair into Na'vi-style braids and paints his body with spartan-fruit dye to mimic the biological striping on the Na'vi body.

GEN ONE EXO-PACK BREATHER UNIT

AIR BREATHER

Spider uses an exo-pack breather unit. Like all humans on Pandora, he cannot breathe the air for more than two minutes before death. Multiple spare battery charges are an essential part of the kit to ensure Spider never runs out of clean air to breathe when he's in the rainforest with the Sullys.

SPIDER'S KNIFE

Amber blade

Visor

Frame

Regulator

BREATHING MASK

The mask has a two-stage demand regulator. It uses battery power to compress oxygen and nitrogen filtered from the atmosphere into a small high-pressure tank.

OMATIKAYA CHILD'S BOW

DATA FILE

SUBJECT Miles "Spider" Socorro

SPECIES Human

AFFILIATION Omatikaya

HEIGHT 6 ft (1.83 m)

AGE 16 years

A TRUE PANDORAN

Spider is a smart kid who has learned how to thrive in the Pandoran forests. Thanks to the moon's lower gravity, he finds it easier to climb trees than children on Earth do. Visiting the Omatikaya village is another of Spider's favorite activities, and he knows what foods are safe for him to eat. He speaks fluent Na'vi, and can read the trails and catch tiny sounds. Spider has to trust his body to know what to do, and the results show in his physical build—as he is bigger and healthier than an average human child his age.

Locking blade (one-handed operating system)

RDA FOLDING KNIFE

Rainforest leaf decoration

OMATIKAYA ARMBAND

Made from rainforest fibers and hand-crafted beads

SPIDER'S ARMBAND

FACT FILE

> Spider frustrates his foster family since he's constantly in the rainforest with the Sully children, and resists any attempts to get him to spend more time with the Hell's Gate human community.

> Like the AVTR Program scientists he visits, Spider is more than happy to share anything he knows about Pandora, if someone asks.

DR. NORM SPELLMAN

THE HEAD OF THE AVTR PROGRAM Dr. Norm Spellman has many responsibilities, including to his family, the Omatikaya clan, and the humans of Hell's Gate. Of the remaining humans on Pandora, Norm perhaps has the greatest knowledge of, and passion for, Na'vi language, culture, and history. Norm remains Jake's right hand, providing another human perspective and vital advice for his decisions. With his ties to both communities, Norm is indispensable to the diplomatic efforts between the Omatikaya and Hell's Gate.

HEADSCARF

A MAN OF TWO WORLDS
Norm wears a mixture of human, Omatikaya, and Olangi clan gear. Sadly, that clan was decimated in the Battle of the Hallelujah Mountains, and the survivors were absorbed into the Omatikaya clan.

RADICAL VOICE

Like Jake, Norm fears the return of the RDA and is ready to confront the corrupt power of the RDA to defend his home. After the RDA do return, Norm helps oversee the evacuation of the Omatikaya people from their settlement next to Hell's Gate to High Camp.

DATA FILE

SUBJECT Dr. Norm Spellman
SPECIES Human
AFFILIATION Omatikaya

FACT FILE

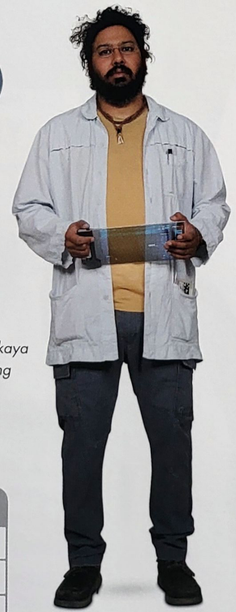
> Norm was able to locate and save his avatar's life during the Battle of the Hallelujah Mountains by applying trauma medicine before it bled out.

> Norm has authorized a database of all the AVTR Program's research in the hopes that one day pro-Pandoran scientists can learn from it.

DR. MAX PATEL

Dr. Max Patel is one of the few humans that stayed on Pandora after the expulsion. He has remained one of Jake's most trusted allies and confidants. After working on Pandora for over a decade, Max is now considered to be the Hell's Gate chief scientist and researcher. The intervening 15 years since the expulsion of the RDA have left Max with dwindling supplies, which has challenged him and his staff to come up with creative solutions to both biological and technical issues that arise.

MAX'S BREATHING UNIT SATCHEL



DOCTOR'S OUTFIT

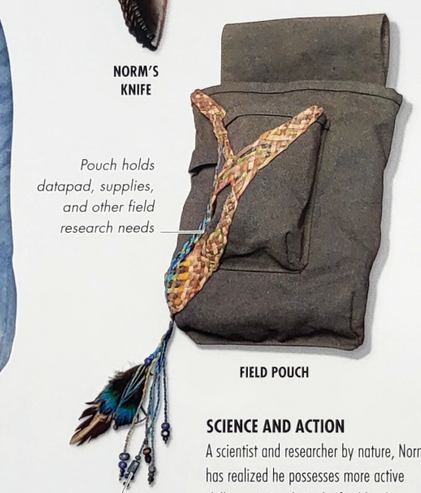
DATA FILE

SUBJECT Dr. Max Patel
SPECIES Human
AFFILIATION Omatikaya

NORM'S KNIFE

RDA WEB BELT

NORM'S SATCHEL



FIELD POUCH

LEATHER ARMBANDS

SCIENCE AND ACTION
A scientist and researcher by nature, Norm has realized he possesses more active skills, too. His role in the final battle against the RDA emboldened him, and Jake's vote of confidence in him allowed Norm to take on more responsibility both at Hell's Gate and with the clans.

LEAD AVATAR

A diligent individual, Norm's natural tendency to prepare for the job at hand stands him in good stead when Jake makes Norm the new head of the AVTR Program, following Dr. Grace Augustine's death. Norm draws on his ability to work with individuals from all walks of life to lead the remaining scientists, avatar drivers, and support personnel. Jake relies on Norm to be his liaison to the wider scientific community at Hell's Gate. Norm spends as much time as possible connected to his avatar. He is always trying to find new ways to remain in his avatar body.

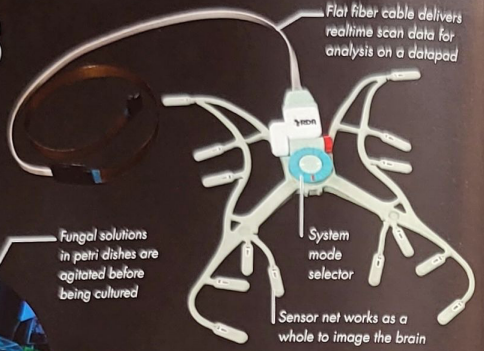
OLANGI NECKLACE
This necklace is made in the traditional Olangi clan style—a single choker element with a longer beaded piece.

HIGH CAMP BIOLAB

THOUGH IT WAS SET UP RAPIDLY in a remote environment, the biolab at High Camp is reasonably capacious and well-equipped for a variety of purposes. In addition to hosting link units and Grace Augustine's amnio-tank, the lab stands ready as a clinic and emergency room for the medical needs of the community. Since human "Earth" air is less toxic to Pandoran breathers than vice versa, a human gas mix is maintained throughout the lab so humans do not need to wear breathing masks. Na'vi visitors, however, require intermittent breaths of supplementary carbon dioxide from a breathing mask to survive in human air. Living in close community with the Omatikaya, Max Patel, Norm Spellman, and the other scientists have made inroads into understanding Pandora's natural world that were not possible in the Hell's Gate days, inspiring many new chapters in the books of Pandoran botany, zoology, and geology.

Fungal solutions in petri dishes are agitated before being cultured

CULTURED SAMPLES



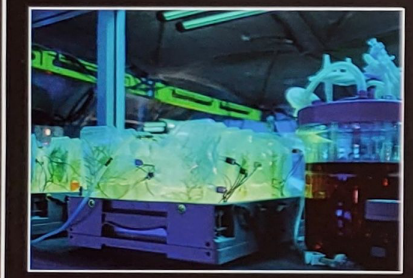
Flat fiber cable delivers realtime scan data for analysis on a datapad

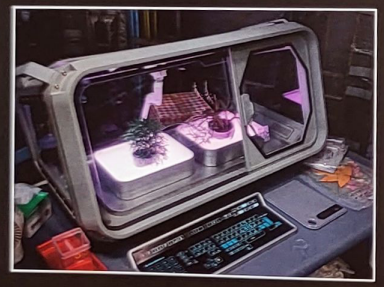
System mode selector

Sensor net works as a whole to image the brain

DIAGNOSTIC HEADSET

Web-like neural sensors are designed to wrap onto a Na'vi-sized head, providing advanced brain diagnostics in situations where a more advanced scanner like the link torus is unavailable. Monitoring and maintaining the cerebral states of avatar bodies is critical to their health and the efficacy of the link system, so any human med tech at High Camp will have this tool at the ready. It has also turned out to be a valuable diagnostic tool for natural ailments of the brain that crop up in the Omatikaya community.





Many lab experiments involve live specimens, such as plants contained within a controlled Pandoran atmosphere cell. A robot arm manipulates the specimens, takes samples, and inserts electrical probes for network behavior testing. Every experimental result is fed into a series of computer simulations, which are then refined by further experiments in an iterative cycle.

THE *EYWA* NETWORK

Particular attention is given to the study of the so-called *Eywa* Network, the web of connections that links the plants and mycelial fungi of Pandora into a group mind. The scientists of High Camp are determined to unravel how it transmits information and communicates with the minds of Na'vi and animals. Out in the field, scientists conduct sorties via helicopter and *ikran* (using avatars) deep into a variety of the moon's biomes, always in search of undiscovered plant and fungal life. In the lab, samples are carefully catalogued and analyzed, using simple techniques and also sophisticated equipment such as electron microscopes, molecular scanners, and rapid genetic profiling machines. On powerful workstations, virtual models of network behavior are crunched around the clock.

Resistant casing

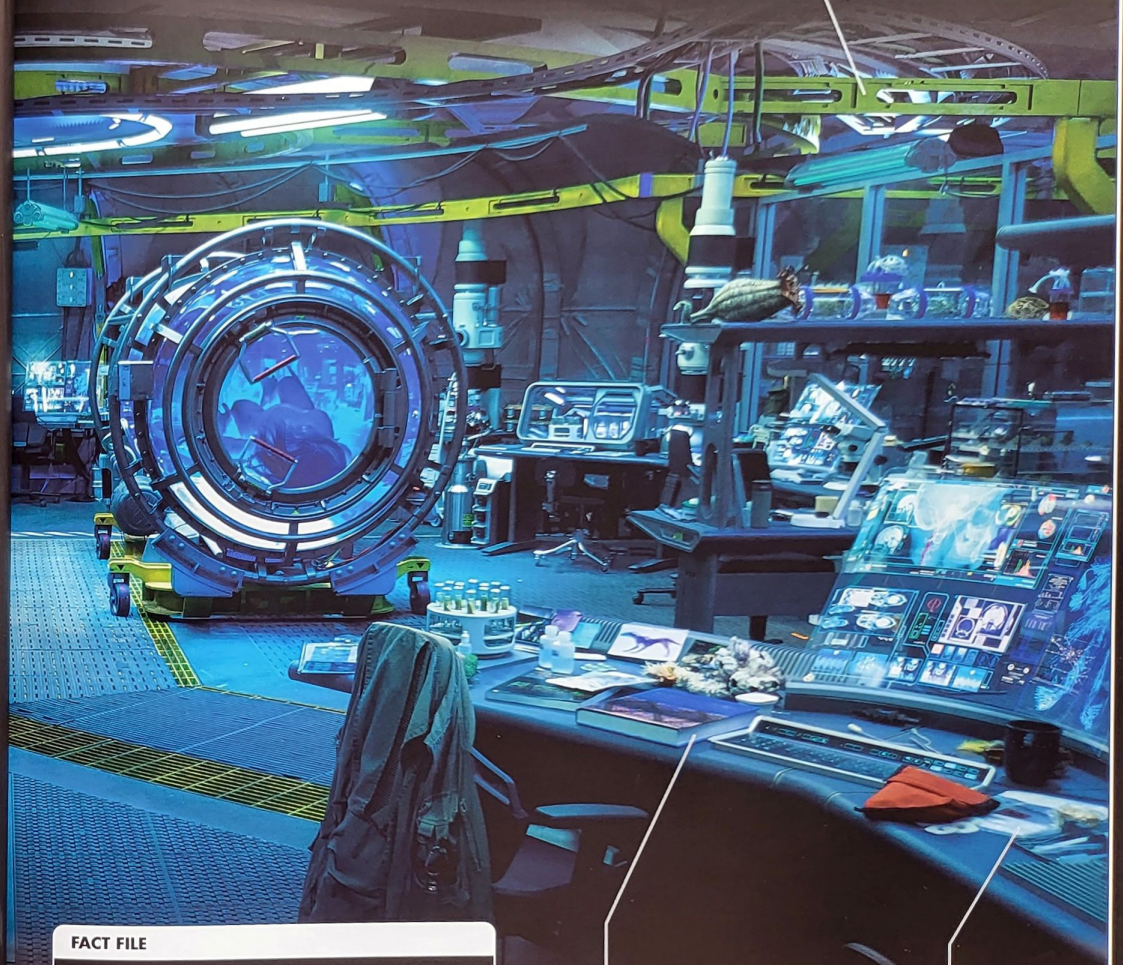
SURVIVAL IN THE FIELD

Taking care of avatars without access to the full equipment of an RDA base of operations is not easy. Luckily the High Camp lab infirmary is stocked with as many standard avatar med kits as Max was able to stuff into a Samson helicopter.

SAMPLES FROM NATURE

Studies of Pandora require careful gathering and storage of scientific samples. Botanical samples are of special interest, especially when they demonstrate the networking behavior of the moon-wide web that produced the *Eywa* consciousness.

Rigid internal and external framing supports the pressurized skin of the lab



FACT FILE

- The biolab is built using the longstanding RDA system of modular, transportable, rigid framing supporting a positive-pressure inflatable skin. This membrane architecture, though not quite as rugged as the all-aluminum shack labs, has proven adaptable to the specific needs of the teams of scientists and avatar drivers.
- An amnio-tank houses and maintains the health of Grace's avatar. The aqueous medium inside the tank is constantly filtered and kept warm, and the avatar is fed via a blood umbilical. Scientists are studying how to feed the body with naturally sourced nutrients when the AVTR medical stores from Hell's Gate run out.

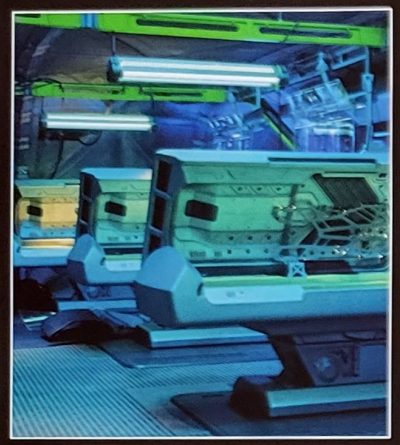
Books and paper are reliable materials in this rugged, remote lab

MEMENTOS

Dimensional photos capture the early days of the AVTR Program.

LINK BAY

FOR THE RDA, the Avatar (AVTR) Program made many contributions to scientific research. But it ended in bloody confrontation and a dramatic defection of avatar drivers from the RDA. It is for these drivers that Max Patel maintains the last surviving suite of avatar link units in a partitioned area of his biolab at High Camp. Hidden in the Hallelujah Mountains, this link setup allows drivers now aligned with Jake Sully's Omatikaya raiders to operate their avatars freely on Pandora. The absolute range of the link connection is unknown, but avatars have explored huge swaths of the moon, confirming that the link's technology may be totally distance-independent.



A far cry from the surgically clean Hell's Gate link room, the High Camp link bay still gets the job done. Four link units line the back wall, while several others are located separately in link shacks arrayed within the High Camp grotto. With no RDA engineering support, Jake's human allies must keep the link system running on their own. Elbow grease and ingenuity have kept things afloat, but dealing with the sensitive and aging equipment is a full-time job.

NEURAL CONNECTION

The link unit creates a connection between a human avatar driver and their avatar, which has been genetically engineered with a human-analogous brain and central nervous system. This brain/CNS remains naturally dormant and unconscious but can be activated by a "psionic link" system into a perfect parity with the brain of the avatar driver. Once the two brains have achieved full "congruency," the avatar body functions as a second body to the driver, allowing totally immersive and interactive "bio-telepresence."

FACT FILE

- When not in use, High Camp avatars are stored and medically monitored in Na'vi style hammocks in an improvised *marui* dwelling.
- Between link sessions, High Camp avatar drivers take advantage of the link bay's kitchen and beloved table hockey game.

Neural induction probes, which help feed sensations to the avatar driver

Sensor cage provides biometric data to make sure the driver is medically safe

Large screens display the state of the link connection and provide real-time biometrics for driver and avatar

LINK-UNIT GURNEY

The bed of the link unit performs important functions but the key element is the toroidal unit arrayed around the driver's brain. This ring not only detects the brain's state at a neuronal level, but also induces most of the sensations that immerse the driver's consciousness in the experience of their avatar body.

Emergency shutdown button

System-level control panel

Scan head ring spins rapidly in operation

Link torus

Link bed hides stim probes beneath special "memory gel" bedding

Drivers sometimes need a leg up!

DATA FILE

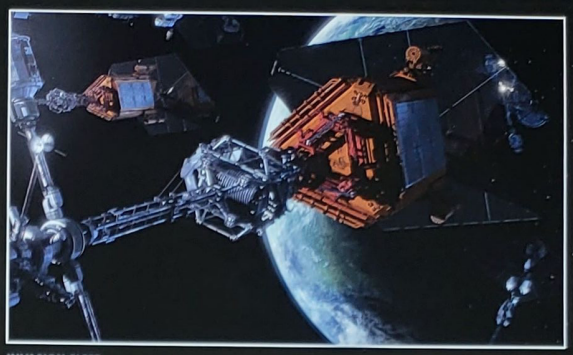
MANUFACTURER	RDA Sci-Ops
MODEL	L1-1
AFFILIATION	Avatar Program

CHAPTER 3:
THE RDA

The RDA commander on Pandora is General Frances Ardmore, whose direct reports include former administrator Parker Selfridge's replacement, Charles Stringer, among others. Ardmore also commands the Recom program (officially named Project Phoenix), which is spearheaded by Recom (recombinant) Miles Quaritch, his lieutenant, Lyle Wainfleet, and other Recom soldiers. Humans are under the RDA's version of martial law. The facilities at Bridgehead used to be a corporate-run operation with a security presence, but that power structure has now reversed. There is now little division between what is conceived of as military and the RDA.

LANDING MODULE

THE RDA'S RETURN TO PANDORA is more accelerated than the steady development efforts that led to the Hell's Gate operation. Facing the prospect of immediate hostile interference, the RDA needs a way to establish new, heavily fortified bases of operation in a very short timeframe. As a solution, engineers propose Landing Modules. These ruggedly built craft are designed to transport much heavier payloads than would be possible using shuttles. Landing Modules can carry all the equipment needed for clearing land, building on site, and maintaining defensive perimeters. Towed to Pandora by a formidable fleet of specially equipped Interstellar Vehicles (ISVs), an invasion force of Landing Modules would be dropped as "Sling Loads" by the starships themselves: instant dominance on the ground, with no shuttle reentry required.



INVASION FLEET
The RDA fleet sent to retake Pandora consists mostly of ISVs carrying Landing Modules. This method of delivering personnel and heavy material is faster and more efficient than using Trans Atmospheric Vehicle (TAV) shuttles.

Module height is equivalent to a 40-story office building

SLING LOAD

Each Landing Module can be packed with different, customized loads. Typical first-wave Landers contain bulldozers and roadheaders for clearing and leveling a landing site. A variety of military assets are also delivered upfront to protect building work. Subsequent loads carry modular architectural systems and temporary defense walls, as well as equipment for construction, on-world materials extraction, and 3D print manufacturing. Most Landing Modules contain human personnel, housed in cryosleep units monitored on the long journey by a small team of med techs.

Reflective shielding with microradiators thermally manages the Sling Load during its long space journey and protects against engine radiation during descent

FACT FILE

> Housed for so long in the proximity of fueled heavy machinery, some Sling Load personnel wake from cryosleep with dreaded "dozer breath."

> Care is taken in the efficient packing of machines and materials into each Sling Load, which functions as a kind of giant vending machine.

LANDING LEG
Huge shock-absorbing pylons with adaptable feet deliver module contents safely to ground.

CONSTRUCTION VEHICLES
An invading army of military construction vehicles are stowed on hydraulic lifts and racks, ready to deploy.

TROOP DEPLOYMENT
Heavily armed AMP Suits and troopers fan out rapidly to establish the security of the Sling Load landing zone.

DATA FILE

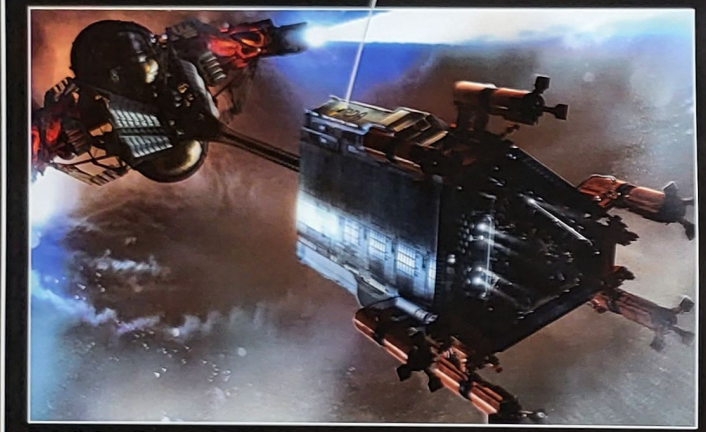
MANUFACTURER DF
MODEL Landing Module
AFFILIATION RDA CON-DEV
HEIGHT 577 ft (176 m)
MAX SPEED Towed by ISV
CREW Up to 300
WEAPONS Two XW460 Typhon Turrets; 40 mm autocannons; AG-MFM 335 missiles

INVASION FORCE

THE RDA FORCES, led by General Ardmore, arrive on the ISV *Manifest Destiny*. The *Manifest Destiny* is sent, along with nine other inbound ships, from a dying Earth to establish a new home for humanity on Pandora. However, Jake Sully and the Na'vi refuse to give up their moon without a fight. With battles that rage from the low-lying orbit of space to the depths of the Omatikaya jungles, Ardmore and her team chase down and hunt Jake and his family. Jake's forces have already partially destroyed Hell's Gate so the base is of no strategic importance to Ardmore, who instead begins the preparations on-site for the construction of Bridgehead City.

SHOCK AND AWE
The mass destruction of flora and fauna is a shattering sight for Na'vi to behold.

Thermal shielding protects module from engine plumes



Sling Load landing modules are equipped with landing lights and heavy, articulated landing legs. They resemble a cross between a spacecraft, an office building, and an oil rig.

Module must protect against planet conditions and empty space

Massive ramp disgorges AMP Suits, troopers, and heavy equipment in huge numbers

PROTOTYPE LANDING MODULE

FACT FILE

> The invasion of Pandora by Ardmore's Expeditionary Force is sanctioned at the highest levels of government on Earth, and sold to the public by a massive disinformation campaign.

> Jake underestimates how close Earth is to total collapse. His models are based on unobtanium, and don't factor in the new urgency to harvest the valuable compound *amrita*, or Earth's need to win for its own survival.

SLING SHOT
A host Interstellar Vehicle (ISV) hovers in the sky using its 1.5g antimatter engines, while an enormous winch with miles of cable lowers a landing module to Pandora's surface.

A defensible perimeter is the first priority for RDA forces. Bulldozers are dispatched immediately to clear any and all debris that might provide cover for the enemy. This prepares not only the Bridgehead build site, but also the kill zone, which will be permanently maintained to defend the city. Troopers are deployed into the burning hellscape in specialized fire suits similar to those used by volcanologists.

BRIDGEHEAD
SATELLITE MAP

ROUGHLY THE SIZE AND COMPOSITION of Long Beach, California, the RDA's new flagship installation is not just a base—it's a city. Bridgehead is vastly larger than the older Hell's Gate, and lives up to its name as a true beachhead for full-blown human colonization of Pandora. This extraterrestrial "boom town" is being built by innumerable subcontractors, all eager for a juicy contract. Overseeing this hive of chaotic construction is RDA CON-DEV, a new administrative entity that consolidates coordination of the land-development process at Bridgehead and other facilities. Called by some the last hope for a dying Earth, Bridgehead embodies the RDA's motto: "Building Tomorrow."

DATA FILE

DIAMETER OF CITY CORE 6 miles (9.6 km)
DIAMETER OF KILL ZONE 10 miles (16 km)
WIDTH OF KILL ZONE 2 miles (3.2 km)
ACCESS 3 land gates; 2 sea gates; 1 river gate
TARGET POPULATION 2 million (upon completion)

CITY OF A THOUSAND CRANES

For several years Bridgehead will be in a constant state of mega construction, but productive output of materials started on day one thanks to the Sling Load system. All heavy construction materials such as steel and concrete are extracted on Pandora, so getting metal mines, aggregate quarries, and concrete plants online is a top priority, allowing the construction behemoth to rise.

FACT FILE

> Bridgehead has nearly 19 miles (30.5 kilometers) of defensive walls.

> The defensive perimeter incorporates incredible firepower, including a variety of gun and missile systems, some of which are installed on massive concrete pylons.

KILL ZONE

Bridgehead requires protection from Jake's warriors and other Na'vi as well as the moon's wildlife. Protecting Bridgehead in this regard is the kill zone, a strip of bare earth, two miles (3.2 km) wide, between the city wall and the natural treeline. Regularly treated with herbicides and defended with automated weapons, this strip of death that was once a forest keeps Eywa and her vast network of sensors and fangs in the flora and fauna of Pandora at arm's length.

BRIDGEHEAD OPS CENTER

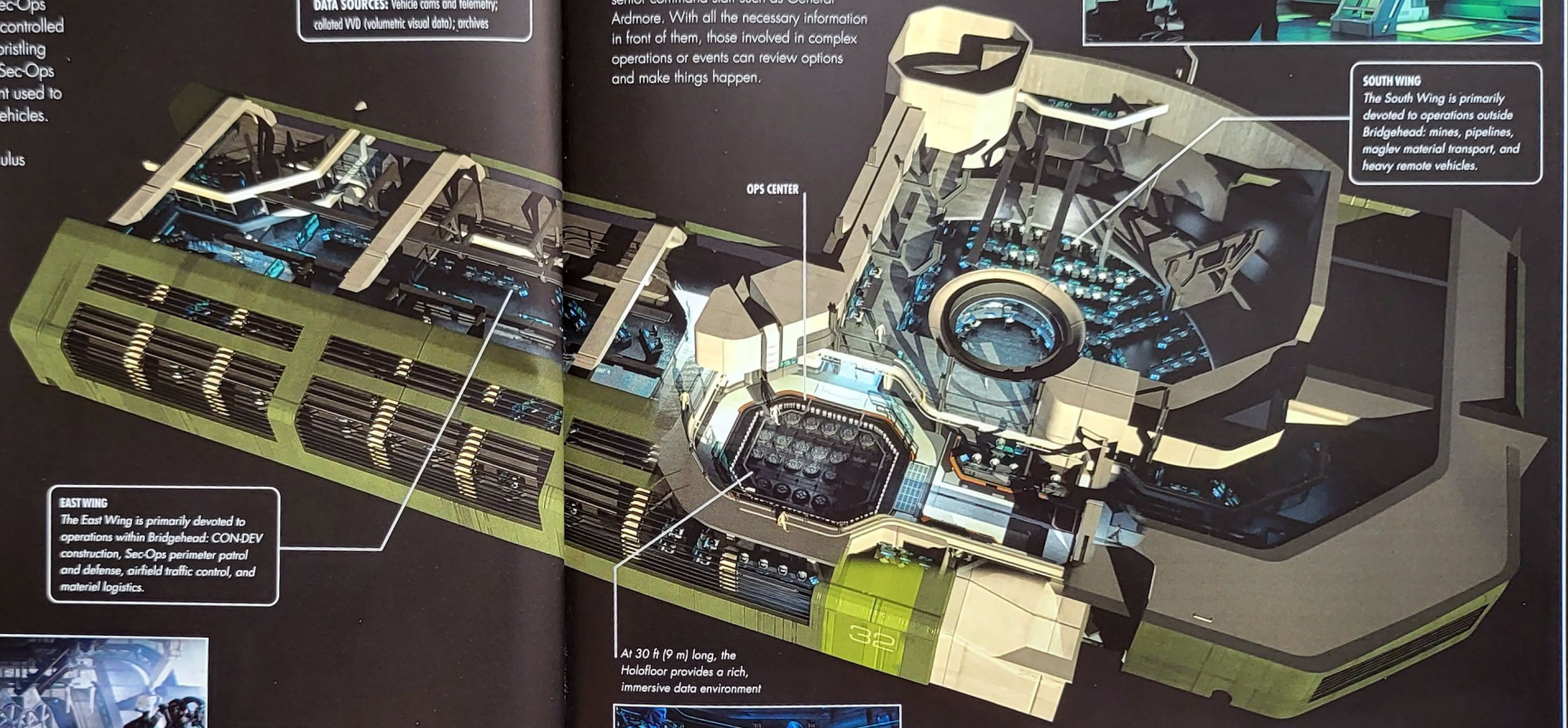
BRIDGEHEAD'S MOST FRENETIC hive of human activity is its expansive, high-tech Ops Center, where civilian and military personnel work hand-in-hand to coordinate the RDA's efforts on Pandora. From mining and super-speed construction to Sec-Ops defense and escort functions, everything is planned and controlled here in an airport terminal-sized communications center bristling with complex data displays. Serving military needs, the Sec-Ops Armor Bay is an immense hangar stocked with equipment used to maintain and equip Bridgehead's huge fleet of military vehicles. Within the more refined Sci-Ops campus, the NeuroLab showcases the most advanced neural scanning and stimulus system that RDA scientists have ever operated.

DATA FILE

NAME Bridgehead Ops Center
CIVILIAN PERSONNEL: Approx. 180
SEC-OPS PERSONNEL: Approx. 120
HOLOGRAPHICS: 1 Holofloor; 2 Conference Sys
DISPLAYS: 4 main types, pseudoholo glass
DATA BACKBONE: Triton 7 VOS
DATA SOURCES: Vehicle cams and telemetry; collated VVD (volumetric visual data); archives

A large grid of holograph projectors is arrayed below a glass floor to produce a "Holofloor" volume. Some distortion occurs as operators walk through the imagery, but redundant emitter coverage minimizes distracting visual artifacts. An overhead camera/sensor ring tracks the body and hand movements of Holofloor users to allow interaction datasets and UI elements. Datapads and personal holo devices can "talk" with the Holofloor, passing information to and from floating holo interface panels.

SEC-OPS ARMOR BAY
From AMP and Skel Suits to ground assault vehicles, SeaWasps, and Kestrels—if it walks, rolls, or flies for Sec-Ops it gets maintained and, in some cases, parked in the Armor Bay. Weapons technicians work hard to keep gun and missile systems functioning optimally in the moon's tropical environment, and engineers perform repairs on vehicles that have sustained damage from contact with Pandoran forces.



EAST WING
The East Wing is primarily devoted to operations within Bridgehead: CON-DEV construction, Sec-Ops perimeter patrol and defense, airfield traffic control, and materiel logistics.

OPS CENTER

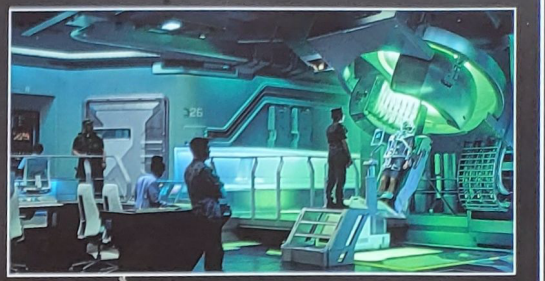
SOUTH WING
The South Wing is primarily devoted to operations outside Bridgehead: mines, pipelines, maglev material transport, and heavy remote vehicles.

At 30 ft (9 m) long, the Holofloor provides a rich, immersive data environment

COMMAND CORE

The primary command zone of this RDA nerve center is the Holofloor and adjacent consoles. In this hot spot, data from all over the RDA's operation—video feeds, maps, GPS vehicle traffic, and archived or live 3D scans of environments—is arranged on the fly by skilled technicians to facilitate the strategic and situational awareness of senior command staff such as General Ardmore. With all the necessary information in front of them, those involved in complex operations or events can review options and make things happen.

NEUROLAB
DPF's NeuroSect E7.2T scanner is the centerpiece of this high-tech medical suite. Brain data is collated and fed to a real-time walk-in holo display, then analyzed further at a specialized workstation.



BRIDGEHEAD OPS CENTER HOLOFLOOR
Boasting a holographic volume measuring 30 in (76 cm) in length, 24 in (61 cm) in width, and 18 in (46 cm) in height, the new Ops Center at Bridgehead supports collaborative review of operational and tactical data in a totally immersive way. Civilian and military personnel can step right into their data in all its complexity and manipulate it in real time to facilitate rapid and effective command decision-making.

FACT FILE

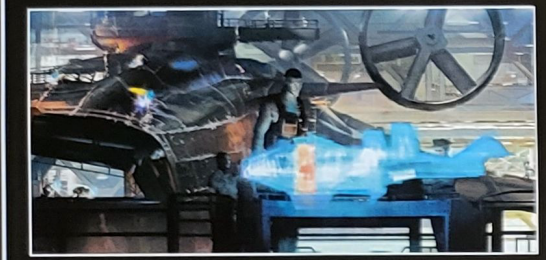
- Other Bridgehead workspaces include additional labs, manufacturing sheds, and towers/hangars for directing and maintaining seagoing assets.
- Laboratories are gathered together in a Sci-Ops campus, with strict security to protect the delicate and secret work going on within.

BRIDGEHEAD NEUROLAB BRAIN IMAGING BOOTH

The RDA's technology for sensing and manipulating neural states in a brain sees impressive implementation in the AVTR Program's link system, but the Neurolab at Bridgehead is at another level. Featuring a state-of-the-art NeuroSect scanner that can extract visual memories from a subject in near real time, it also displays brain states like never before by using a walk-on Holofloor.

SHIPYARD FACTORY 3D PRINTING

EXPLOITING AND COLONIZING PANDORA requires an incredible tonnage of material and equipment, most of which cannot practically be shipped to the new world by ISV. Transporting heavy materials requires accelerating them to 70 percent of the speed of light (and decelerating them, too), so harvesting and building is done on-world wherever possible. The key to a quick and efficient strategy is rapid manufacturing, primarily enabled by advanced 3D printing techniques. With metals and petrochemicals extracted from Pandora, 3D printers can churn out vast numbers of components for vehicles, weapons, robotics, data equipment, and even buildings, which are then fed into rapid, highly automated assembly lines. With minimal human intervention, such factories can produce a veritable army of assets to aid in the reconquest of Polyphemus' moon.



Advanced manufacturing extends from tiny quantum computing components all the way up to enormous vehicles such as the SeaDragon, seen here. While smaller items might be built almost in their entirety within the bed size of a 3D printer, large vehicles must be made in slices, which are then combined using overhead gantries and robotic swarm welders. A holographic interface shows 3D print technicians the progress being made on individual slices and components.

BUILDING WITH LIGHT

Metal components such as ship hull sections are made by a high-precision, magnetically lensed implementation of DLD (Direct Laser Deposition). In this process, a laser print head rapidly heats metal powder and deposits it as molten metal on the build. Successive thin layers of cooling metal build up to become a solid metal part. Parts requiring extreme precision can then be machined as needed, but in most cases the finely resolved raw 3D print can be used directly. 3D printers are also used to print plastics, composites, and even complex electronics.

High output gantry printers have multiple print heads that must coordinate

Precise motors and constant calibration are required for accurate parts

Metal powders are fed to the print head via pressurized tubing

Freshly printed metal is white hot, but cools rapidly, ready for overprint

FACT FILE

> To minimize assembly, some assets are 3D printed all at once, using multiple print heads to interweave totally different materials.

> Not all RDA equipment can be printed on Pandora. Sophisticated quantum electronics and other microscale components are shipped from Earth.

> While manufacturing is as automated as possible, human assistance is always required to deal with inevitable unexpected problems.

> Bridgehead's largest printer, shown above, has an enormous build volume of 220 ft (67 m) long x 95 ft (29 m) wide x 45 ft (14 m) high.

CONSTRUCTION

THE CONSTRUCTION OF BRIDGEHEAD and its supporting outposts is larger than anything the RDA has attempted on Pandora. Getting it done requires a blank slate attack on the logistical challenges, and what emerges are innovative building techniques and the need to rely on heavy automation at all scales. Overseen by the RDA's CON-DEV (Consolidated Development) wing, the process is heavily robotic and algorithmic, doing away with all RDA remote vehicles controlled by human operators. From robotic raw material extraction, through high-tech manufacturing, and then on to swarm assembly of enormous structures, the new style of RDA construction is productive and highly organized.

Modular, inflatable temporary structure

Telescoping crane booms give maximized reach over large area sites
Handlers can pick up material directly or convert to cabled lifting hooks
Sensors feed to a networked computer "brain"
Hubless wheels with integrated direct electric drive

FRONTIER TOWN

Contrasting with the lush, humid climate of Pandora's tropics, Bridgehead is an often-muddy landscape. But like many frontier towns before it, the development also bustles with the spirit of people embracing a challenging new life very far from home.

CONSTRUCTION BLIMP
With the ground teeming with activity, large loads are often moved by air. Lift systems can hover almost indefinitely and lower massive payloads right on target.

DATA FILE
MANUFACTURER FDM Heavy Equipment
MODEL MC-RA 220
AFFILIATION RDA CON-DEV
SIZE 326 ft (99 m)
MAX SPEED 67 mph (108 kph)
CREW 1 remote pilot or fully automated

MACHINES FOR BUILDING

It takes a variety of vehicles and technologies to make Bridgehead construction work. Heavy lift blimps and nimble robotic cranes loom over robotic swarm assemblers and hulking yellow AMP Suits, while humans drive a variety of ground utility vehicles. Hundreds of tower cranes stack prefabbed structures into enormous power and processing plants, while a web of high-speed maglev train lines delivers materials and robots to exactly where they are needed. To get operational buildings and dormitory housing up rapidly, in-situ 3D printing of concrete architecture and components is essential, as is the use of lightweight, modular inflatable buildings.

Concrete buildings and components are 3D printed.

SWARM ASSEMBLERS

RDA CON-DEV'S LATEST-GENERATION robotic swarm assemblers embody its "Triple R" construction strategy—Rapid, Remote, Robotic. RDA engineers design these machines in a variety of sizes and tool loadouts to serve a plethora of roles, making possible every type of on-site fabrication with a minimum of human labor and management. This is crucial for RDA expansion, since sending people to Pandora via ISV starship is a slow and incredibly expensive process. Construction robots can be manufactured in almost unlimited numbers on-world, using local materials fed to advanced 3D printers. Each assembler carries its own host of cameras and sensors, but as a group they operate as an intelligent, coordinated swarm, guided by a suite of sophisticated and layered algorithms.

Modular attachment points allow quick swaps of tools and effectors

HEXBOT LIGHT
This mini swarm assembler packs powerful functionality into a small package. Rarely called upon to carry parts, the Hexbot Light is instead a super-speed finisher. Its focus is welding, grinding, riveting, and even painting—and what it lacks in size it makes up for in efficiency. Quick feet and high-priority access to the swarm control protocol keep this little bot from getting crunched by bigger ones.

Cameras and other sensors keep bot aware of its dynamic environment and workmates

Hidden fans keep batteries cool inside rugged metal shell

Different tools and effectors at different ends of the vehicle allow for multitasking

HEXBOT HEAVY
The workhorse of the assembler fleet, the Hexbot Heavy is a multi-role swarm assembler around the size of a large dog. Able to carry medium-size material and perform nearly all weld and fastening functions, it is equally at home on the ground or climbing up tall structures. Insectile gripping toes and suction devices give grip on any surface, including vertical.

Suction grip frame for handling heavy sheet materials

Adaptable flatbed keeps a tight hold on construction materials at any work angle

Multipurpose grippers can lift heavy parts with surprising dexterity

CONSTRUCTION MATERIAL HAULER SUPPORT BOT
The Hauler keeps the team equipped with fresh materials and parts—pipes and fittings, struts and panels, utility components, and myriad fasteners to put them together. A busy worksite demands several Haulers, each swarmed by many smaller assemblers hungry for the parts needed to complete their next tasks.

BIG QUAD FOLDS UP FOR STORAGE AND RECHARGING

Limbs are carefully weatherized to function in mud and other rough conditions

Fingertips have force sensors and simple mechanisms for easy field maintenance

Primary stereo camera assembly is similar to that seen on CON-DEV bulldozer

Depth-sensing camera gives the bot a real-time 3D model of its frontal work zone

Heavy gauge crash bars protect against worksite collisions

DATA FILE

MANUFACTURER	FDM Heavy Equipment
MODEL	QA-19 Block3
AFFILIATION	RDA CON-DEV
MAX SPEED	7 mph (11.2 kph)

Chemical sniffers detect industrial hazards such as gases or fire

Heavy electric motors are directly integrated

Shock-absorbing feet with heavy rubber pad and slip sensors

Rubber crash bumper

When conditions are especially muddy, arms are fitted with protective sleeving

BIG QUAD

The largest assembler in the CON-DEV stable has four legs and is about the size of a dump truck. With two powerful arms and grippers it is the heavy lifter of the operation, capable of handling large building components and placing them precisely so smaller assemblers can weld or fasten them into place. An oversize battery pack allows the Big Quad to operate for 48 hours continuously before needing to recharge, and to serve as an emergency charging station for smaller bots. Like an older sibling, it carries the heaviest loads and keeps an eye on the others.

SKEL

OCCUPYING AN INTERMEDIATE weight class between human and AMP Suit, the Skel was developed as a multipurpose capability amplifier for industrial and military applications. In a work setting, a Skel can operate safely around unprotected human personnel due to its lightweight manufacture, excellent driver situational awareness, and automated collision-avoidance features. The moderate size of a Skel also means it can use airlocks and corridors built for humans, unlike the lumbering AMP Suit. On a war footing, a Skel makes a human as tall, strong, and fast as a Na'vi, and able to shoulder an arsenal of high-caliber assault weapons and even a devastating flamethrower. In the marine context, aboard a SeaDragon a Skel can dextrously wrangle cargo, chains, and other heavy equipment as part of vehicle maintenance or *tulkun* hunting operations.

Robotic exoskeleton does heavy work with minimal operator exertion

Camera sight

SKEL M69-AR
The Skel M69-AR is chambered in .50 caliber BAT to pack a much larger punch than equivalent human guns.

SKEL WEAPONS

Given the complexity of delivering human combat personnel to Pandora, maximum fighting power must be afforded to every set of boots on the ground. The Skel AR (assault rifle) and its shorter-barreled brother the Skel Bullpup put the firepower of a classic Browning machine gun in the hands of every Skel trooper, arming them for success against Na'vi and the thick-skinned wild beasts of Pandora. Skels can also be equipped with a flamethrower for clearing vegetation—and also for burning homes in order to force indigenous peoples into RDA compliance.

Y70 Bullpup with camera sight and underslung grenade launcher

FACT FILE

> Iron sights are tough to use in a Skel, so a camera targeting system is employed, linking sensors on the gun with the driver's mask HUD.

> While most Skel engagements are at firearm range, ambitious Skel fighters train in robotic martial arts techniques when they get the chance.

> Skilled Skel drivers can do almost anything with the machine's hands, from precise, technical work to holding a mug of hot coffee.

High-strength carbon fiber used extensively to reduce weight

Force feedback is channeled from foot sensors to the operator's stirrups

DATA FILE

MANUFACTURER Ukii
MODEL EXO-32 Light Mobility Platform
AFFILIATION All RDA divisions
HEIGHT 9 ft 6 in (2.9 m)
MAX SPEED 20 mph (32 kph)
WEAPONS Skel AR and Bullpup; flamethrower; Bullet Hose

Semi-prehensile feet can grasp terrain and roots for aggressive forest running

Shoulder servo

As with the AMP, waldo arm control can be engaged and disengaged

Flamethrower

Collapsible stock

Without its driver, a Skel looks truly skeletal

SKEL WITHOUT DRIVER

SKEL FLAMETHROWER
The FT-M3A1 series is the result of years of development. Based on the older Bushboss FD-3, the FT-M3A1 offers improvements on fuel capacity, range, and mobility. The flamethrower is connected by a hose to a tank system containing fuel and a propellant.

Internal structures are made of noncorroding stainless steel

MARINE SKEL
The "Sea Skel" is ready for duty on the SeaDragon or Bridgehead's docks. Can a Skel swim? Skel sailors try hard not to find out.

GENERAL FRANCES ARDMORE

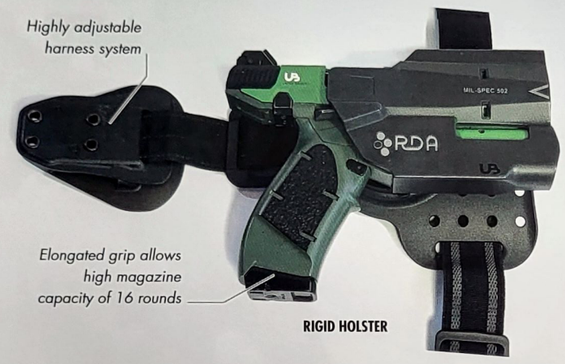
GENERAL FRANCES ARDMORE is the RDA's new Expeditionary Force Commander. Operating as on-world commander and security leader, she is charged with the RDA/Sec-Ops' new top priority: retaking Pandora to make it humanity's new home. Ardmore is just the kind of officer that the RDA needs to handle this big-theater operation. She is a well-educated and practiced political strategist, with a demeanor that conveys intelligence and mental agility. She is not only highly capable in combat but also a masterful thinker and planner.

FOUR-STAR GENERAL

DECORATED COMMANDER
While Colonel Quaritch met with corporate interference, nothing stands in General Ardmore's way. She has waged and won many wars in her time.

SEC-OPS

BRIDGEHEAD SEC-OPS



Highly adjustable harness system

Elongated grip allows high magazine capacity of 16 rounds

RIGID HOLSTER

New gen camo inspired by Pandoran natural patterns

Standard-issue field cap with officer insignia

STEELY COMMAND

Ardmore's style is different from that of her predecessor, Colonel Miles Quaritch. Where Quaritch was obsessive and monomaniacal, Ardmore exudes detachment. She's unemotional and machine-like, and signals that she's in charge without being physically imposing. Her kind of command is quieter, and she's defined as much, if not more, by how those around her behave. Ardmore is a cold-blooded visionary and her mandate is simple: establish Bridgehead as the stronghold from which the RDA can take back the moon. In these desperate times, Ardmore is prepared to do whatever it takes.

Multifunctional tactical light—laser and rangefinder

Z-33 PISTOL
For its new mission, the RDA has adopted the .40 caliber United Ballistics Zarkov-33 as the standard sidearm for all Sec-Ops and Cet-Ops troopers.

DATA FILE

SUBJECT	General Frances Ardmore
SPECIES	Human
STATUS	RDA Expeditionary Force Commander
HEIGHT	5 ft 4 in (1.65 m)
AGE	53 years

Micro motors deliver big torque from a small volume

Telescoping limbs adapt to driver proportions

Dextrous hands can do delicate work

Harness with integrated body motion sensors

Boots strapped into responsive mechanical bindings

Telescoping in legs is also used for shock absorption

ARDMORE'S SKEL SUIT

Actuated spine bends and twists with driver

Highly adaptable ankle and foot design gives a solid foundation on terrain

REAR VIEW

STANDARD-ISSUE COFFEE MUG

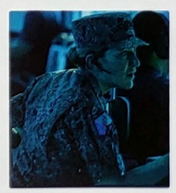
DATA FILE

MANUFACTURER	Ukii
MODEL	EXO-32 Light Mobility Platform
AFFILIATION	All RDA divisions
HEIGHT	9 ft 6 in (2.9 m)
MAX SPEED	20 mph (32 kph)
WEAPONS	Skel AR and Bullpup; flamethrower; Bullet Hose

FACT FILE

> General Ardmore sometimes uses a Skel Suit for boxing workouts.

> A brilliant tactician and negotiator, General Ardmore can instantly assess a situation, understand the logistics presented, analyze all possible outcomes, and build a winning (or least non-zero-sum) strategy for engagement.



CAPTAIN MICK SCORESBY

MICK SCORESBY IS A weather-beaten and tough-skinned aquatic big-game hunter. He arrived on Pandora with the first new wave of humans, which included General Ardmore. The RDA hired Scoresby and placed him in charge of a newly minted fleet of sea vessels, including large SeaDragon ships. His singular mission is to hunt and harvest as many *tulkun* as he can. Scoresby is thrilled to be back in the game because hunting ocean creatures is a long-expired practice back on Earth.

Standard work attire

Knife can be held in a sheath strapped to Scoresby's leg

Sharp blade for gutting fish—or punching a hole in the side of a beer can

NEW RESOURCES

Now that the RDA has discovered *amrita*—the extractable value that lies within the *tulkun*—General Ardmore provides Scoresby with all the most sophisticated hunting vehicles, including spotter aircraft, Mako fast-attack subs, nimble Picador boats, Matador boats, and amphibious Crab Suit mini-subs.

SMALL WEAPONS

The RDA is throwing everything it can at the hunt for *tulkun*. As well as big boats and vessels, Scoresby uses smaller weapons, including knives, guns and mounts, harpoons, locator devices, and tags.

AFTER THE HUNT

Scoresby can't think of a better way to celebrate a successful *tulkun* hunt than by drinking a few cans of beer with his crew.

DATA FILE

SUBJECT Captain Mick Scoresby
SPECIES Human
AFFILIATION RDA

FACT FILE

> Scoresby's main vessel, from which he controls the fleet and deploys assets, is his very own SeaDragon.

> Quaritch quickly conscripts Scoresby, with his SeaDragon, for his side project of hunting down the Sully family.

Wading boots

DR. IAN GARVIN

RDA MARINE BIOLOGIST Ian Garvin is regarded as the on-world scientific expert on Pandora's oceans, and the *tulkun* in particular. Though he would prefer to have nothing to do with *tulkun* hunting, the RDA uses the threat of shutting down his research to coerce the scientist into working with them. Upon his arrival on Pandora, Garvin led an existing oceanographic research team. This small team managed everything itself—and Garvin is well suited to the task. He knows his way around a lab, but he's a field researcher to the core, happily risking his life where others would dread to roam. A seasoned scuba diver, he regularly traverses the predator-infested Pandoran oceans taking samples, imaging specimens, and capturing data.

Touchscreen mobile workstation

Tablet can be used to extend a desktop workstation by docking into a stand

STOLEN DATA

With the use of the knowledge stored on Garvin's datapad, including locator tags, the RDA can find and hunt down more *tulkun* than ever before.

Scanner collects data from environment and transmits it to chip card

Field vest

Wristband contains chip-card processing information from scanner

Dive watch

Dive knife

FIELD RESEARCHER

Garvin originally conducted marine research in the same way that xenobotanist Dr. Grace Augustine once did in the jungle. He had a small, mobile, habitable, research lab vessel—a catamaran hull with a couple of trusses across it and two shacks built onto it. Garvin is able to set up a shack on a beach for a while. Then his mobile lab can dock with the landed setup and, if he needs it to interface with *olo'eyktan* (clan leader) Tonowari or the Reef People, his lab can drop anchor in their cove for easy access.

DATA FILE

SUBJECT Ian Garvin
SPECIES Human
STATUS Marine biologist
AFFILIATION RDA
HEIGHT 6 ft (1.85 m)

FACT FILE

> Garvin discovered the powerful, natural compound known as *amrita* while dissecting the brains of the *tulkun*.

> A passionate oceanographic explorer, Dr. Garvin studied and fell in love with Pandora's oceans and the rich and exotic life found within.

GENERAL TECH

FROM HIGH-TECH GADGETS to the latest small arms, RDA tech is used widely by RDA personnel and Jake Sully's resistance fighters, who are only too happy to steal equipment for their own purposes. Advanced methods of encrypted communication, as well as powerful, globally networked data interfaces, allow RDA users to operate in a common system of information and control across Pandora. A family of new-generation weapons with enhanced capabilities against hostile fauna and indigenous opponents keep personnel safe in the field. Another new and critical piece of equipment protects RDA people close to base—the IFF (Identification/Friend or Foe) badge (transponder), which transmits a signal that inhibits the automated gun and missile systems installed at RDA facilities. RDA crew know that if they forget their IFF, they may not live long enough to regret it.

SAT COMM CASE

PERSONAL DATAPAD

STANDARD GEN2 DATAPAD

BIO SCANNER
Built ruggedly and equipped with a multipurpose scan wand, the CR-4 is a powerful life-saving tool for remote operation. Max Patel keeps his in the High Camp Biolab.

CR-4 DIAGNOSTIC SYS

DATA EVERYWHERE
Advanced datapads are critical for operating in the RDA's data-rich work environment. Coming in a variety of sizes, these devices use the same pseudoholographic display tech found in RDA computer workstations.

RUGGED FIELD PAD

IFF TRANSPONDER

DON'T SHOOT
With all the automated weaponry defending RDA assets, it is critical for troopers and vehicles to carry an IFF transponder.

TRANQ DARTS

V6 TRANQUILIZER GUN

Sensor arch bristles with radar and antennae

RECOM AR MAG

NEW WEAPONS FOR A NEW WORLD
In the early days, most RDA weaponry was borrowed from service on Earth. But based on the fateful lessons of the Battle of the Hallelujah Mountains, RDA engineers have worked hard to field a new generation of Pandora-ready defenses.

K-BAR MK3 COMBAT/UTILITY KNIFE

Z-33 STANDARD FIREARM

AM6-75L "FIRE ARROW" GUIDED MUNITION

Munitions are specialized for use against different targets

TOXON-81 MANPAD (MAN-PORTABLE AIR-DEFENSE) MISSILE LAUNCHER

SKY DEFENSE
Designed for an anti-aircraft role, this missile system has been adapted for Pandoran use with targeting that can lock onto biological signatures. When captured by Jake's raiders, the launcher does quite well in its original role against aircraft.

CHAPTER 4:

THE RECOM PROGRAM

Recoms (or Recombinants) are a new breed of transgenic human/Na'vi hybrid warriors created by the RDA. Classified as Project Phoenix, the Recom program was accelerated immediately after the RDA defeat in 2154 as part of a fully funded counteroffensive invasion force. Recoms are created and grown in an identical fashion to avatar bodies, but, unlike avatars, they do not need a human driver to operate them from a remote location. The memories of deceased RDA Sec-Ops soldiers are uploaded directly to the consciousness of Recombinants, so these new hybrid warriors are untethered from the need for a psionic link between human and hybrid body.

COLONEL QUARITCH

A RECOMBINANT WARRIOR standing 9 feet 5 in (2.9 meters) tall, Quaritch is biologically young—only slightly "older" than Jake's avatar when he arrived on Pandora. He also has the mind of human Miles Quaritch, who was 51 when he died. This mix of physical youth and experience of mind is a deadly combination. Retaining his human rank of colonel, Quaritch has been fully briefed on his new existence. Now he prepares himself and his squad of 11 Recoms for their new mission: to hunt down and kill Jake Sully, the traitor to humanity and leader of the Na'vi insurgency responsible for the expulsion of the RDA from Pandora.

"I KNOW YOU'RE ALL ASKING YOURSELVES THE SAME QUESTION, 'WHY SO BLUE?'"

COLONEL MILES QUARITCH

ADVANCED GENETICS

Quaritch awakens on board the interstellar warship ISV *Vindicator* after six years of transit in an amnio-tank, in which the daily use of proprioceptive neuromuscular simulators conditioned, matured, and strengthened his Recom body. His identity and memory were uploaded from an encoder device called a Soul Drive. As an autonomous being, a Recom like Quaritch is inherently more stable and self-sustaining than an avatar, representing a massive advancement in genetic engineering.

SOUL DRIVE
The subject's memories are written into the structures of the Soul Drive's crystal as thousands of layers of nanoscale etchings.

Years later, Quaritch is back in action in the Omatikaya rainforest.

FACT FILE

> Quaritch has a simple definition of what a commanding officer is supposed to do: win.

> The Colonel believes that to win the fight, you must understand your enemy. In his new form as a Recom, he now feels one step closer to understanding the Na'vi.

TACTICAL ADVANTAGE

Unlike humans and machines, Recoms are not detected by *Eywa* as a threat due to their Na'vi DNA. This means that Recoms can walk freely through Pandora without triggering *Eywa*'s immune response of dispatching animals to defend the moon. Going undetected by *Eywa* gives Quaritch the tactical advantage he's always wanted in the forest: using Na'vi-like stealth, he is able to establish his own hunting ground.

DATA FILE

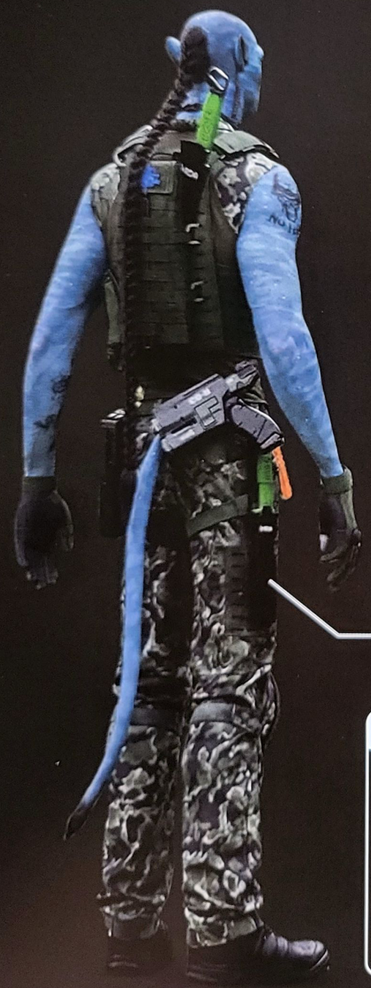
SUBJECT Colonel Miles Quaritch
SPECIES Recom
AFFILIATION Phoenix Project
HEIGHT 9 ft 5in (2.9 m)
AGE 20 years

Kuru ("neural whip") is covered by hair braid for protection
Leather knife sheath
Analog watch for use in high-magnetic fields
Gun holster
Harness attached to belt using triangular D-ring as anchor point for extraction rope
Tactical boots
Standard RDA forest camo
FRONT VIEW
BACK VIEW

DRESSED FOR SUCCESS
Quaritch's appearance is a reflection of the state of his mind: focused and disciplined. All the equipment he keeps on him fulfills a purpose toward the clearest path to victory.

CORPORAL WAINFLEET

CORPORAL LYLE WAINFLEET is Colonel Quaritch's trusted aide, entrusted to be the team leader of the Recom unit. Wainfleet earned his position as a result of his diverse combat skills and bullish devotion to his fellow troopers. He has always looked out for the person on his left and his right, ever since his days as a human AMP Suit driver and Samson gunner. Now a Recom warrior, Wainfleet is keen to return to the fight on Pandora, and, as he sees it, get some payback.



SEASONED SNIPER

Wainfleet specializes in sniping and is equipped with a long rifle that combines shooting accuracy with increased muzzle velocity. Although he could have opted for a shorter variant for better maneuverability in the jungle, Wainfleet would rather go through things than around them. He likes the increased power that the longer barrel has to offer.

GUNSLINGER
One firearm is never enough. Recoms are trained to handle and carry multiple weapons.

FACT FILE

- After some time on Pandora, Wainfleet and the other Recoms cut off the lower legs of their pants and ditch their tactical boots for bare feet in order to move faster and more quietly and to get deeper into the rainforest.
- Wainfleet has five tattoos, including a dragon on his left forearm.

RECOM TRAINING
Formerly an assigned Jungle Escort to the avatars in the Avatar Program, Wainfleet has had exposure to the lives of the human/Na'vi hybrids. From the trials of maintaining good *kuru* hygiene to the struggles of getting around human-size facilities, this Recom has heard it all. What his former self would shrug off as "their problem" has become the intelligence and preparation he needs for life as a Recom.

RECOM BLADE
Wainfleet's machete is standard-issue for Recoms.

DATA FILE

SUBJECT Corporal Lyle Wainfleet
SPECIES Recom
AFFILIATION Project Phoenix
HEIGHT 9 ft 3 in (2.8 m)
AGE 20 years

PERSONALIZED TATTOOS
The tattoos Recoms had as humans are issued to them in their new bodies to help ease the psychological transition.

RECOM GUN
Wainfleet's Z-33R Recom Pistol sits in a holster on his equipment belt.

RECOM EQUIPMENT

THE RECOMS ARE EQUIPPED to achieve their mission by any means necessary and to ensure the RDA's advancement and its military goal: to retake Pandora in order to provide a new home for humanity. The RDA believes that every living being on Pandora wants to repulse it, and the Recoms must be aware of that fact every second of every day. Their mission is facilitated by a range of tools and artillery that aids them in all scenarios.

RECOM BREATHER
Supplementary carbon dioxide is critical for the operation of Recom personnel inside human-air facilities. The development of a compact breather system allows Recoms to "sip" carbon dioxide every minute or two.

AAS-RO2 ATMOS ADAPTATION SYSTEM

Slogan promotes the "unstoppable force" of the Recom front line

RECOM TEAM BADGE

RECOM I.D. TAG

FRAG GRENADE

FRAG GRENADE

FRAG GRENADE

ALEXANDER ZHANG PRAGER WALKER MANSK FIKE

Fires up to 40 rounds a minute

HIGH-POWERED PISTOL
The Recom Pistol, like all Recom weaponry, is built to maximize devastation. The hollow point rounds fragment upon impact, sending shards of the round in every direction. The impact alone is enough to knock most targets to the ground.

RECOM Z-33R PISTOL

Long barrel for high muzzle velocity

RECOM M69-AR

0226-LSAR (LINKABLE SKEL ASSAULT ROUND)

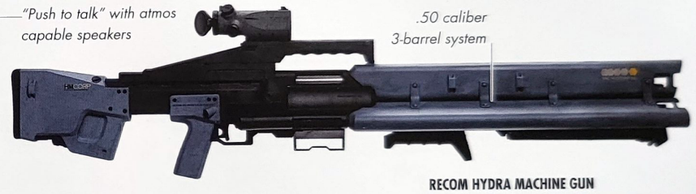
RECOM KNIFE

RECOM KNIFE IN SHEATH

HYDRATION PACK

"Push to talk" with atmos capable speakers

RECOM THROAT COMMS



.50 caliber 3-barrel system

RECOM HYDRA MACHINE GUN

ZDINARSK WARREN BROWN LOPEZ

SKEL-BASED WEAPONRY
Recom weapons are often modified versions of the artillery units for the human Skel Suit platform. They are adjusted for targeting orientation and for maneuverability of the Recom physiology.

RECOM UNIT

Regarded as the RDA's muscle, the Recom unit is a special forces operation that takes orders from the top and assists in any extraordinary circumstances. These well-trained soldiers toe the line and are respectful of the chain of command, following tactics that they are told will keep them alive beyond the perimeter. But it's going to take more than guns and manpower to subdue the Pandoran rainforest, and their survival may depend on how much they are able to adapt in the field.

CHAPTER 5:

RDA VEHICLES

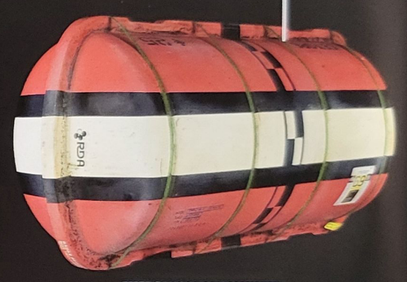
The RDA wants to make Bridgehead a true territorial foothold, which makes the new city far more dangerous to Pandora and the Na'vi than the old mining operation at Hell's Gate. The RDA has called on its brightest minds to develop a new generation of faster and deadlier vehicles, adapting the latest tech from a war-torn Earth to the needs of an unwelcoming world. By sea, air, and land, these high-performance mobile machines build, patrol, and protect RDA installations across the moon, enabling RDA expansion into new territories and new forms of resource extraction. A primary new focus is Cet-Ops (Cetacean Operations) and its aggressive, purpose-built hunting vessels.

S-76 SEADRAGON

THE ALL-NEW RDA PANDORAN sea vessel S-76 SeaDragon is a large Wing-In-Ground-Effect (WIGE) ship designed for hunting Pandora's whale-like *tulkun*. This heavily equipped, high-speed platform has an impressive range of many thousands of miles. At low speed it operates as a surface ship, but can rise up on hydrofoils then lift fully out of the water to fly low over the waves in ground effect. With a top speed of 130 knots (150 mph/241 kph), the SeaDragon can keep pace with its helicopter escort over all but the very roughest seas.

Once a tulkun is within range, the SeaDragon must deploy its herding and hunting craft as rapidly as possible. Mako hunter subs are dropped into the water through a moon pool that opens in the hull.

In case of emergency, self-inflating rafts are deployed automatically or by crew



EMERGENCY RAFT CANISTER

VIAL OF *AMRITA*

HUNTING PLATFORM

The SeaDragon serves as a support ship to an array of smaller vessels, which deploy from its foredeck and aft ramp. On Pandora, SeaDragons are manufactured in a dazzling high-tech shipyard using locally mined materials. Huge hull and wing parts are made in molten metal by enormous 3D print gantries. Once fully assembled, the SeaDragon is launched into the sea, ready to hunt *tulkun*.

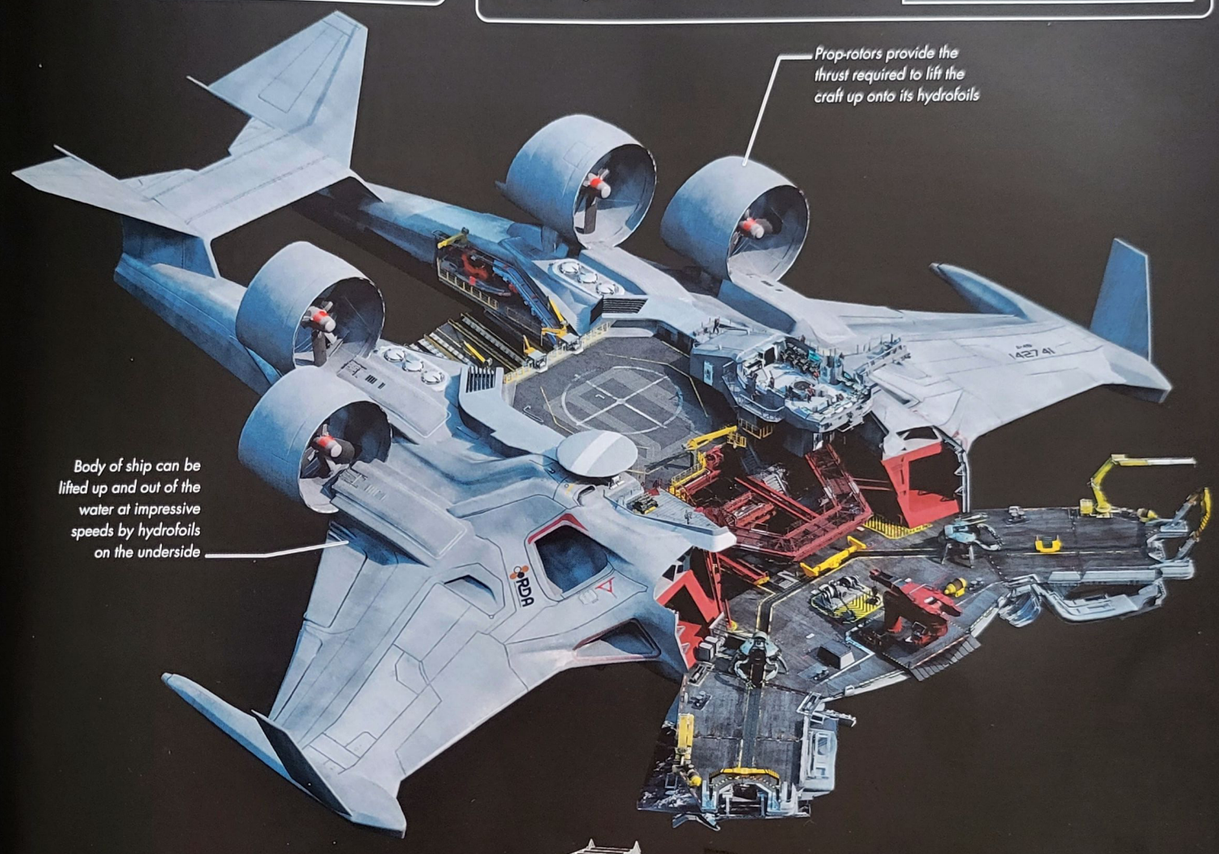
DATA FILE

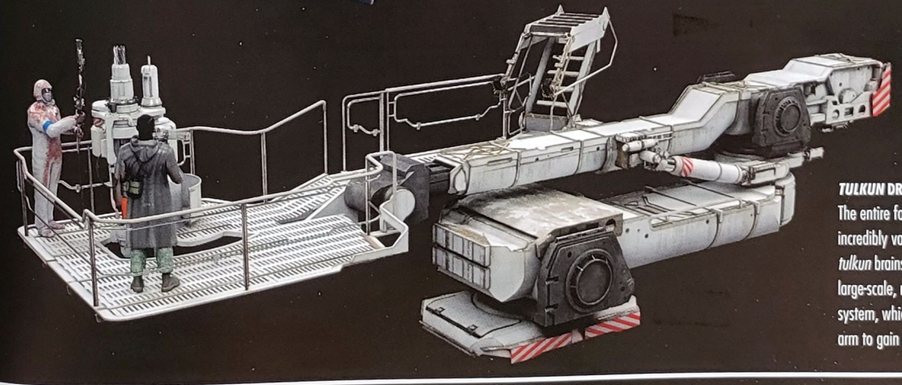
MANUFACTURER General Dynamics
MODEL S-76 SeaDragon
AFFILIATION RDA Cet-Ops
LENGTH 397 ft (121 m)
MAX SPEED 130 knots (150 mph/241 kph)

FACT FILE

> Part sea-craft and part plane, the SeaDragon is totally unique but bears some family resemblance to the hulking Dragon aircraft from which it derives its name.

> The SeaDragon is purpose-designed as a mothership for *tulkun* hunting, deploying surface boats and hunter subs to track, harpoon, and harvest the great creatures.


Prop-rotors provide the thrust required to lift the craft up onto its hydrofoils
Body of ship can be lifted up and out of the water at impressive speeds by hydrofoils on the underside
RDA



***TULKUN* DRILL CRANE**

The entire focus of Cet-Ops operations is harvesting the incredibly valuable material known as *amrita* from *tulkun* brains. To do this, Cet-Ops has engineered a large-scale, medical-grade drilling and extraction system, which rides atop a precise robotic crane arm to gain entry to the animal's mouth.

MATADOR

SPECIALLY DESIGNED as a high-speed forward command, support, and harpoon platform, the Matador operates as the quarterback of the Cet-Ops *tulkun* hunting squad. Equipped with a powerful engine, it is quick to deploy and even quicker to chase down its prey. Its 50-foot (15-meter) "deep V" hull and twin jet drives propel the crew of eight through big swells at more than 40 knots (46 mph/74 kph) while offering exceptional maneuverability.

MATADOR COCKPIT

STATE-OF-THE-ART PLATFORM

The Matador takes full advantage of the SeaDragon's advanced magnetic launch ramp. Military-grade shock-mitigating seats protect its crew from the pounding of heavy waves. Cutting-edge navigation, target acquisition, and communications equipment ensure safe operation and efficient coordination with the SeaDragon.

PORT SIDE VIEW

DATA FILE
MANUFACTURER RDA
MODEL Matador
AFFILIATION RDA Cet-Ops
SIZE 50 ft (15.2 m)
MAX SPEED 45 knots (52 mph/83 kph)

FACT FILE

> The Matador serves as the skipper's mobile command center, with advanced sonar and underwater imaging plotted on the front display.

> A successfully lodged harpoon and tether can cause the Matador to be dragged along by the *tulkun* until the animal surrenders.

BOW VIEW

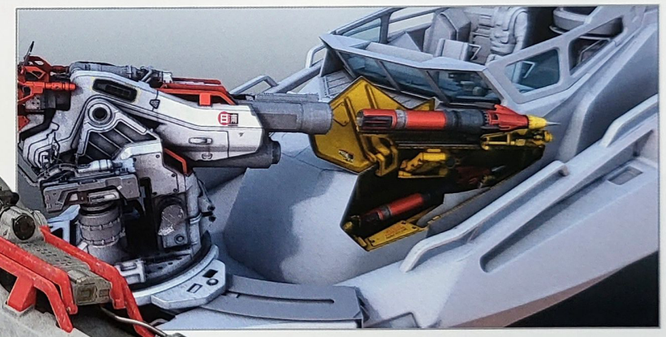
STERN VIEW

HYDRA MACHINE GUN

AMMO BELT

ONBOARD ARMORY

Onboard equipment includes a gyro-stabilized acoustic depth-charge launcher, measuring 3.5 in (90 mm), and three 50-caliber Hydra machine guns. A harpoon launcher is mounted on a dedicated swivel at the bow. This big gun features a locking barb projectile, a high-tensile cable, and an integrated winch—all designed to never let the big one get away.



RELOADING SYSTEM

ROCKET PROJECTILE

HARPOON GUN

PICADOR

PICADORS ARE FAST AND AGILE surface boats used in short-range patrol and defensive response roles. A variant is deployed from the SeaDragon as a pursuit boat in *tulkun* hunts. Picadors' speed lets them get to the target animals before any other vehicle and apply special weapons and tactics to herd the creatures into a kill opportunity. Issuing volleys from the "Chunker" grenade launcher before kicking in with the brutal Sound Cannon, Picador crews show their quarry no mercy. They will not hesitate to insert their boat right into a *tulkun* pod to separate out the target animal.

Sensor "basket handle" equipped with radar, antennae, cameras, and more

Windscreen HUD shows critical tactical and vehicle data

Chunker grenade launcher

Smokescreen launchers for strategic attack or retreat

COCKPIT

BOW VIEW

STERN VIEW

DATA FILE

MANUFACTURER	Baxter Industries
MODEL	Picador 9300
AFFILIATION	RDA Cet-Ops
LENGTH	32 ft (10 m)
MAX SPEED	58 knots (67 mph/107 kph)

THE CHUNKER

A critical component of the Cet-Ops hunting methodology, the Chunker 90 mm depth charge grenade launcher features water-depth-sensitive "smart" munitions and an advanced optical rangefinding/targeting system that allows gunners to lay down accurate and coordinated herding fire. The munitions' deafening underwater concussions stop *tulkun* from diving to escape, and keep them moving in the desired pattern.

FACT FILE

> Its dual jet drive allows a Picador to turn within its own length and stop suddenly by dropping its thrust reversers.

> A rescue variant—orange and gray, unarmed but with powerful lights—is deployed onboard SeaDragons and other large RDA vessels.

SOUND CANNON

A fearsome machine hated by the *tulkun*, the AHD-9 Sound Cannon has been adapted from a design used for crowd control on Earth. Its resonators have been reconfigured to emit high-decibel acoustic pulses that are spectrally matched to the most sensitive frequencies of *tulkun* hearing. The sound it produces is agonizingly painful to the creatures, which move away from it immediately.

MAKO SUBMERSIBLE

THE FAST AND DEADLY Mako submersible was developed for coastal harbor defense, but under Cet-Ops it doubles as a formidable undersea counterpart to the Picador chase boat, helping to herd *tulkun* from below. The Mako's massive power and smooth hydrodynamic shape give it the ability to rapidly overtake a target animal and hit it with harpoon torpedoes that inflate lift bags. These force the *tulkun* to the water's surface and slow it down, allowing the Matador kill boat to catch up and do its grisly job. When not "bagging" *tulkun*, the Mako provides underwater perimeter defense for the SeaDragon, warding off any aggressive creatures with high-explosive torpedoes, wildlife net torpedoes, and a rotary speargun.

Mako submersibles are dropped from an S-76 SeaDragon.

MAKO TEAM BADGE

Three ducted propellers provide redundancy and huge thrust output

Massive battery array in main fuselage allows sprint power and long-range flight

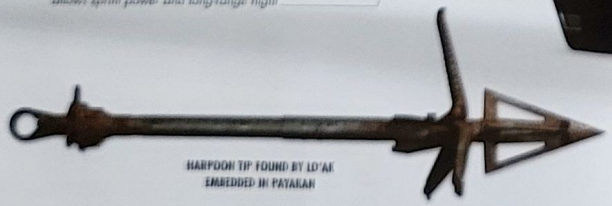
PORT SIDE VIEW

DATA FILE

MANUFACTURER	KMS
MODEL	MS-3 Type 2
AFFILIATION	RDA Cet-Ops
MAX SPEED	78 knots (32 mph/52 kph)

UNDERWATER HUNTERS

Herding massive marine creatures from beneath the waves is no easy task. Hitting an anchor point between the animal's armor plates requires accurate firing of harpoon torpedoes, so Mako pilots must get in right below the target beast to give their gunners the best shot. The sub is fast enough to overtake adult *tulkun*, nimble enough to avoid their giant flukes, and tough enough to take an accidental collision. Like their Picador-based teammates, Mako crews are willing to embrace risk and revel in the thrill of the hunt.



HARPOON TIP FOUND BY LO'AK EMBEDDED IN PAYAKAN

ROTARY SPEARGUN PROJECTILE

Canopies provide excellent downward visibility for obstacle avoidance

FRONT VIEW

Aft sensor dome includes rear-facing sonar capability

Tough rubber coating adds extra durability to key areas

REAR VIEW

Pilots can supercharge their hydrobatic maneuvers with the Mako's tunnel thrusters

STARBOARD SIDE VIEW

Rear planes aid in maneuvering and keep kelp out of the props

Impact-resistant polycarbonate canopies protect crew

Searchlight for dark undersea environments such as Pandora's oversize kelp forests

FACT FILE

> In an emergency, the Mako's cabin can be quick-purged to allow safe escape of the pilot and gunner. Cet-Ops breathing masks function underwater.

> Pilot instrumentation includes a holographic head-up display indicating key information including a 3D sonar terrain map of the sub's underwater environs.

> Mako crews often personalize their craft with nose art.

LIFT BAG HARPOON

CRAB SUIT

CRAB SUITS OPERATE AS underwater AMPs (Amplified Mobility Platforms). The main body is a sealed pilot cabin—rated to a depth of 1,640 feet (500 meters)—from which powerful arms and legs can unfurl. At Bridgehead, Crab Suits conduct underwater construction and security. Working under Cet-Ops, they deploy from a SeaDragon mothership to assist in the recovery of dead *tulkun* taken by the swift hunting boats and sub. Driving anchors into the creatures' armored backs and wrangling heavy towing lines, Crabs are the manual muscle of the hunting team. Armed with a rotary speargun, they can also play a defensive role if needed.

Slightly ungainly on land, the Crab Suit really comes into its own underwater.

Carapace and other body panels are fabricated from lightweight carbon fiber
Tough polycarbonate canopy
"RASSGAT"
Folded limb

SUB MODE

FACT FILE

> The grip force of the Crab Suit's manipulators is three-quarters the bite force of a great white shark on Earth.

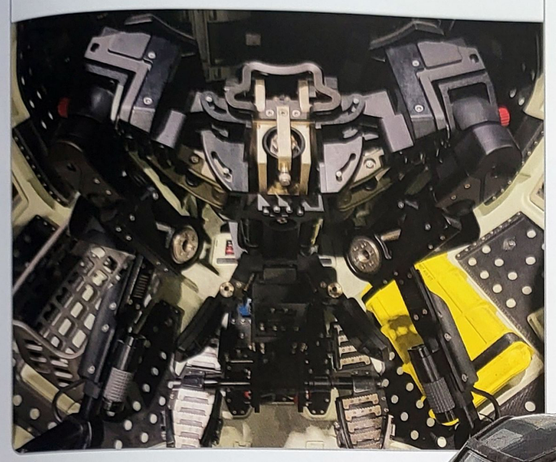
> Sub Mode operates underwater, but Crab Mode can operate both above and underwater.

AMPHIBIOUS CRAFT

On its return to Pandora, the RDA needed a way to project force—and do heavy work—beneath the waves. A water-adapted variant of the workhorse AMP Suit was considered, but it could not match project performance targets. The decision was made to pursue a completely new design using the strategy of biomimicry (the imitation of natural forms and functions) to achieve most of an AMP's capability but with vastly better speed, agility, and range underwater. Thus the Submersible Mobility Platform was born.

CONTROL COCKPIT

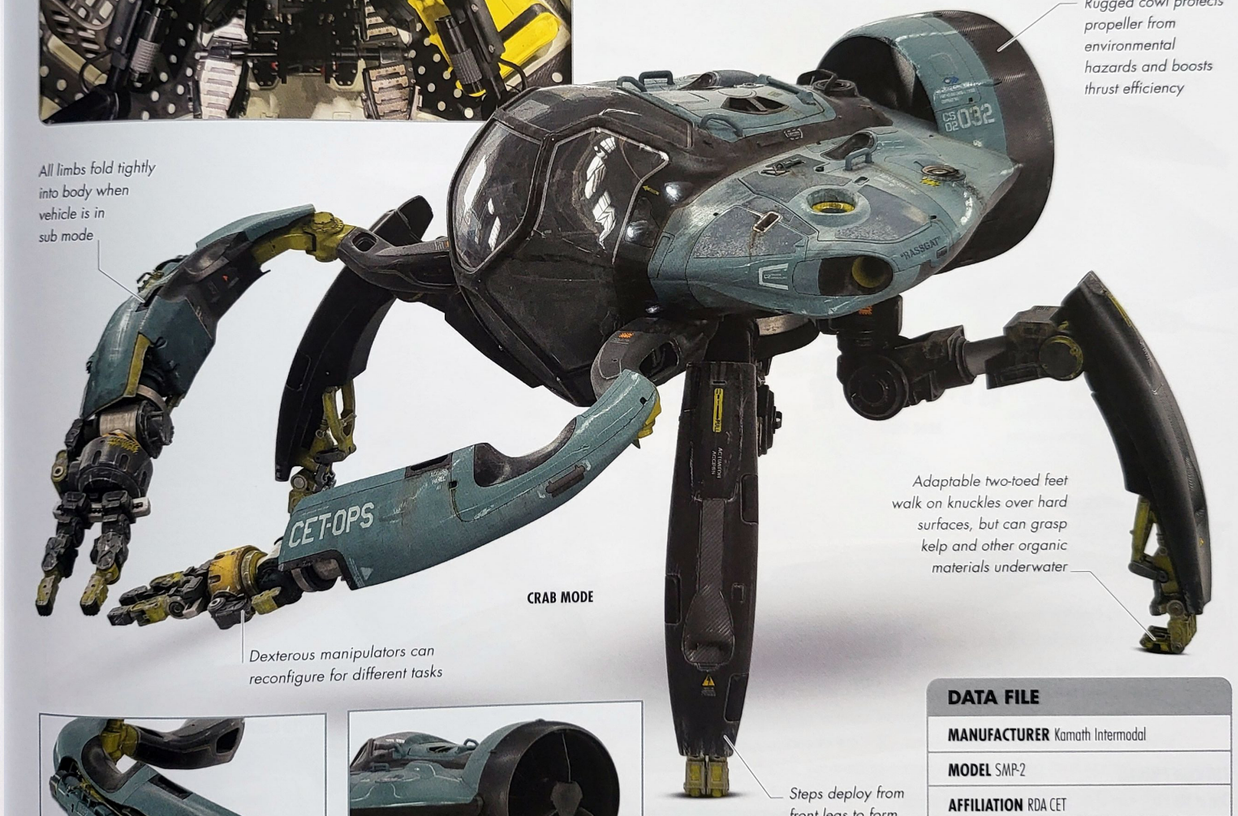
The Crab Suit cockpit is small but packed with functionality. Like the AMP Suit, the Crab uses a force-feedback armature for arm control, but places it in front of the pilot rather than behind. Foot and knee pedals control leg locomotion, while hand controllers double as joysticks for submarine flight.



INSPIRED BY NATURE

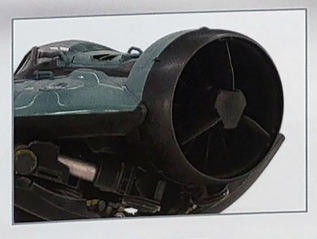
The suit's crab-like stance and appearance are no accident. Its engineers looked to nature for inspiration as they developed the vehicle's hydrodynamic shapes and modes of locomotion.

Main thruster is a powerful, electrically driven ducted propeller


Rugged cowl protects propeller from environmental hazards and boosts thrust efficiency
All limbs fold tightly into body when vehicle is in sub mode
CET-OPS
"RASSGAT"
Adaptable two-toed feet walk on knuckles over hard surfaces, but can grasp kelp and other organic materials underwater
Dexterous manipulators can reconfigure for different tasks
Steps deploy from front legs to form a ladder, by which pilots and crew mount the Crab Suit

CRAB MODE

ROTARY SPEARGUN



MAIN THRUSTER

DATA FILE

MANUFACTURER	Kamath Intermodal
MODEL	SMP-2
AFFILIATION	RDA CET
MAX SPEED	19 knots (22 mph/35 kph)
CREW	1 pilot
WEAPONS	Rotary speargun (self-propelled munitions)

SEAWASP

THE SEAWASP IS A NEW-GEN, high performance aerial gunship designed for a number of missions, including long-range patrol and *tulkun* spotting for the hunting fleet as well as Sec-Ops escort and CAS (Close Air Support). While showing its lineage from the AT-99 Scorpion in its weaponry and cockpit layout, the quad-rotor SeaWasp is a major evolutionary development with significant improvements in speed, range, and maneuverability. Because the RDA's operational focus has shifted seaward, this craft has been designed and built to endure the challenging conditions of tropical maritime operation. Quick as an arrow but tough enough for the constant grind of refueling and rearmament at sea, the SeaWasp is a force to be reckoned with for Jake Sully and his Na'vi allies.

MISSION-READY
The ground team refuels and rearms a SeaWasp gunship before takeoff.

Cooling inlet for rotor assembly mechanics
Hellfire guided missile (from array of 16)
Winglets with control surfaces, for athletic maneuvering

FACT FILE

> The SeaWasp's skin is marked with a fine honeycomb pattern, which absorbs radar and adds strength to the light composite material.

> The SeaWasp's cockpit features large wraparound displays flanking a multi-mode, holographic head-up display.

DATA FILE

MANUFACTURER	FDM Aerospace
MODEL	AT-101
AFFILIATION	RDA Sec-Ops
LENGTH	46 ft 4 in (14 m) without chin gun
MAX SPEED	284 knots (327 mph/526 kph)

REAR VIEW

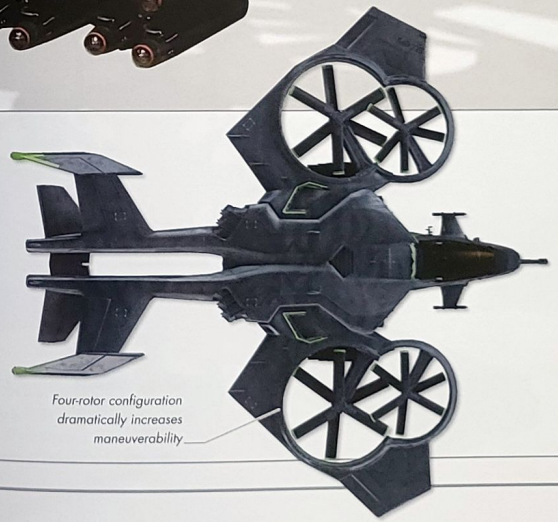
SIDE VIEW

DEPLOYED CONFIGURATION

***TULKUN* PINGER**
One of the many roles of the SeaWasp is as a spotter aircraft, helping its SeaDragon mothership to find *tulkun* pods. The spotter craft carries transmitter devices known as Pingers, which pilots can launch at specific *tulkun* targets, lodging the Pingers in the animals' back armor and marking them for interception by the SeaDragon and its hunting pack of water vehicles.

Acoustic and light beacons signal presence of tulkun
Telescoping anchor spike drives beneath tulkun armor and locks in

SIDE VIEW



BUILT FOR SPEED

The SeaWasp is the fastest rotorcraft ever fielded on Pandora, and in some respects is half airplane. Engineers gave it a sleek shape, similar to a jet fighter, and a powerful pair of pusher turbine engines that give maximum forward propulsion without heavy pitch of the rotors. Winglet extensions to the rotor cowls provide added lift and control surfaces, increasing range and providing high-speed aerobatic maneuverability usually seen on fixed-wing aircraft. The rotor system is also impressive. Sporting an innovative dual-rotor layout on each wing, the "quad rotor" configuration allows pilots to aggressively pitch and turn the craft at lower speeds, making the SeaWasp a very nimble machine.

KESTREL GUNSHIP

A NEW-GENERATION ducted-rotor gunship, the Kestrel is a fighting and general transport craft in a heavier weight class than the RDA's older general-utility aircraft, SA-2 Samson. It is faster, far more heavily armed, and, with a larger cargo bay and loading ramp, and has a new level of troop and materiel deployment capability. Active magnetic cancellation and hardened electronics allow full operability in Pandora's flux cons (concentrations of intense magnetic fields). Pilot situational awareness is improved with a bubble canopy and a host of new sensors. A veritable arsenal of integrated weaponry is accompanied by two door-gun positions and a rear ramp gunner, making the Kestrel very difficult to surprise or destroy.

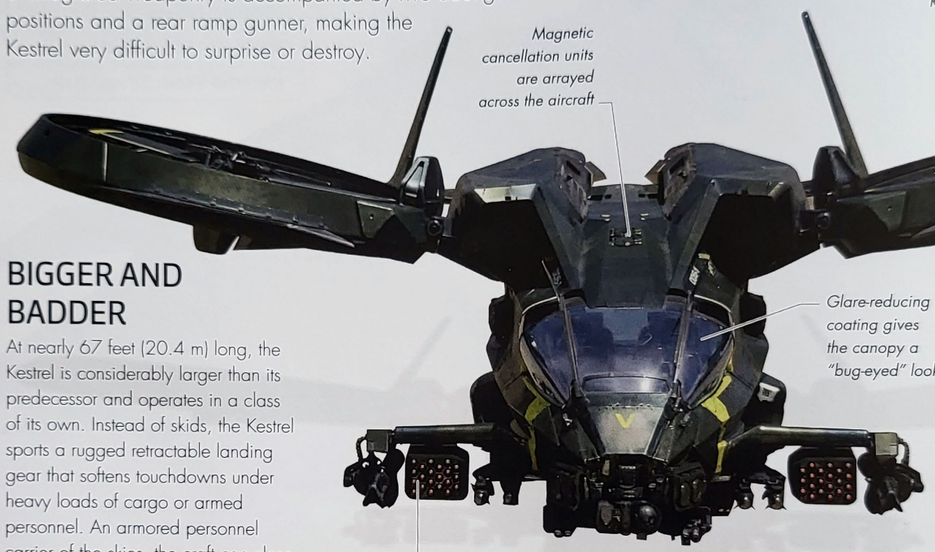
Kestrel gunships fly in formation over the Pandoran landscape.

Magnetic cancellation units are arrayed across the aircraft

Rotor system similar to that of the SA-2 Samson, but larger and lighter for increased output and efficiency

BIGGER AND BADDER

At nearly 67 feet (20.4 m) long, the Kestrel is considerably larger than its predecessor and operates in a class of its own. Instead of skids, the Kestrel sports a rugged retractable landing gear that softens touchdowns under heavy loads of cargo or armed personnel. An armored personnel carrier of the skies, the craft can close its doors and ramp for long-range speed, then open them to unleash hell from three Hydra-B gun positions.



Glare-reducing coating gives the canopy a "bug-eyed" look

Newly engineered rocket pods deliver destruction at record speed

FRONT VIEW

DATA FILE

MANUFACTURER Aerospatiale

MODEL SA-9

AFFILIATION RDA Sec-Ops

SIZE 66 ft 7 in (20.3 m)

MAX SPEED 235 knots (270 mph/435 kph)

Exhaust reduces IR heat signature to help evade insurgent missiles and the eyes of Pandoran beasts

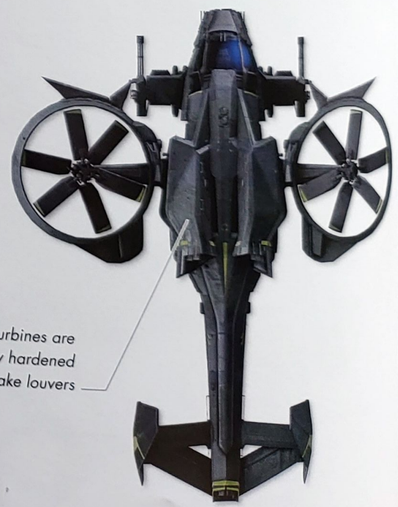
Tail configuration inspired by AT-99 Scorpion Gunship improves maneuverability of the heavy Kestrel

SIDE VIEW

Low-slung weapons pylons and generous door and ramp access facilitate easy rearming

Fuselage patterns created by 3D print manufacturing

Huge twin turbines are protected by hardened intake louvers



TOP VIEW

DEATH FROM ABOVE

As the RDA reopens business on Pandora, it is taking no chances against the moon's indigenous warriors and deadly creatures. The armament of the SA-9 Kestrel reflects this commitment to aggressive operation even in the face of fierce danger. Boasting no fewer than five independently operable, high-caliber machine guns as well as the venerable Hellfire missile system and new volley-firing rocket pods, the Kestrel is ready to take on almost anything the inhabitants of Pandora can throw at it. It's no wonder the best Sec-Ops pilots and gunners jump at the opportunity to join a Kestrel crew.

FLIGHT CONTROLS

PILOTS' SEATS

Camera-based targeting systems for accurate longer-range fire

Patterned shroud improves upon the Hydra-A with optimized strength and cooling

Three fixed barrels (.50 cal FMJ)

HMCORP MBS-23B "HYDRA B" PINTLE-MOUNT HEAVY MACHINE GUN

Pintle can be repositioned to any point on motorized deck track

Innovative muzzle cooling system

Each ammo feed runs through the weapons boom to a 1,250-round magazine inside fuselage

Weapons pylon, also called a stub wing

GAU 33-K STUB WING GUN
The H&F GAU 33-K is a 30 mm Gatling Autocannon capable of firing 1,750 rounds per minute.

HELLFIRE GUIDED MISSILE
Manufactured by HMCORP, the AG-MFM 355 "Hellfire" is a self-guided air-to-air and air-to-ground missile. It features real-time fuse control and redundant "fire and forget" targeting systems.

Can be fitted with HE explosives as well as incendiary warheads for defoliating the jungle

Shrouded twin barrels

KM-722 DUAL CHIN GUN
Made by Griffin Defense Systems, the KM-722 is a 20 mm Autocannon (x2), with a firing capability of 750–1,000 rounds per minute (x2).

FACT FILE

> The Kestrel's large personnel and cargo bay makes it ideal for the military avatars known as Recoms.

> Special forces can drop into the jungle rapidly from a Kestrel using fast-rope booms on both sides of the aircraft.

CHAPTER 6:

THE METKAYINA CLAN

The Metkayina are one of the Na'vi sea cultures, known as "Reef People," that live among coastal reefs, barrier reefs, and atolls. Their idyllic island home, fringed with enormous mangroves among which they built their village, is protected from the wild ocean by a barrier reef that forms a natural seawall. In every way, Metkayina life is tied to the rhythms and wildlife of their rich marine habitat, which they hold dear. Although relations with other clans are currently peaceful, the Metkayina maintain their reputation as fierce warriors who would die to protect their home. Though they were too remote to fight with the Omatikaya in the initial battle against the Sky People, they know that, with the RDA's return, their tranquil world may not remain peaceful for long.

ATOLLS

THE ATOLL IN WHICH the Metkayina reside is a ring-shaped seawall approximately 30 miles (48 km) across. The wall structure has a number of openings, called "passes," which allow the tide to flow in and out. The terraced tide pools are unique to Pandoran reefs. Tunnels lined with powerful invertebrate colonies pump water to the top of the barrier reef, where it wells up in pools and cascades down, forming terraces. This adaptation allows, over millions of years, the corals on the barrier reef to grow high above the water-line, quite unlike any coral reefs found on Earth.

DATA FILE

REGION Coral atolls

TERRAIN Mineral deposits around seawater lagoons

POPULATION Metkayina

OCEAN VISITORS
Upward water flows can bring in unique fishes from the ocean that the Metkayina rarely encounter in the shallows.

FACT FILE

> At its center, the open lagoon is 300 feet (91 meters) deep.

> The height of the outer seawall ranges from 50 to 100 feet (15 to 30.5 meters).

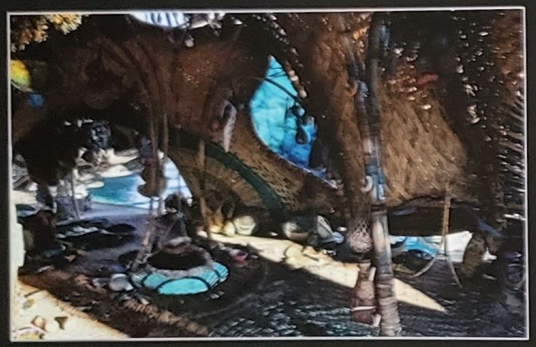
> The Metkayina village is located two miles (3.2 km) off one side of the seawall.

DISTANT LOCATION
The atoll is just under 300 miles (483 kilometers) northeast of the rainforest where the Omatikaya live. It is about an eight-hour flight by *ikran*, including three one-hour rest stops for the animal.

REEF NA'VI BELIEF
The Reef Na'vi believe the seawall was created by Eywa to enclose the lagoon and promote life.

METKAYINA VILLAGE

METKAYINA DWELLINGS, known as *marui*, hang between the roots of enormous mangrove trees. They are constructed with a firm, woven flax similar to rattan. All Metkayina structures are designed to be strong enough to withstand Pandoran storms but light enough to not be injurious to the tree's roots. Some of these villages have existed for thousands of years. Structures are constantly renewed but seldom replaced. Almost all resources that the Metkayina use for constructing and repairing their *marui*—as well as all the tools they use—are taken from the reef and surrounding ocean, and the island forest. Metkayina clan members are careful only to take from the water exactly what is needed so they do not deplete the ocean of life.



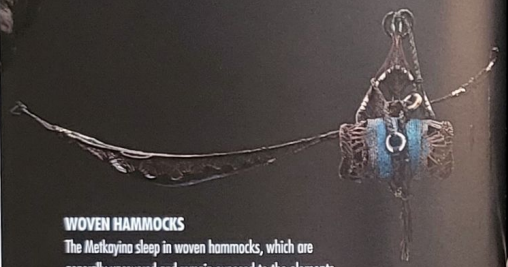
COMMUNAL MEALS

The entire Metkayina clan share their evening meal, with everyone in the community coming together to contribute food and stories. They believe in building a strong and trusted community. The Metkayina have perfected every style of cooked fish, from grilled to smoked, utilizing herbs and spices that are picked on the island or traded with other clans. Meals are served on large Pandoran shells and gourds that have been halved and decorated. Each Metkayina has their own handmade plate. Typically made from wood or tree bark, the plates are fashioned to be held in one hand, leaving the other hand free to eat and serve.

Mangrove root system used for rigging and tensioning entire Metkayina village

FACT FILE

> There are many villages of the Metkayina clan. The one that Jake Sully and family live in is called *Va'ru*.



WOVEN HAMMOCKS

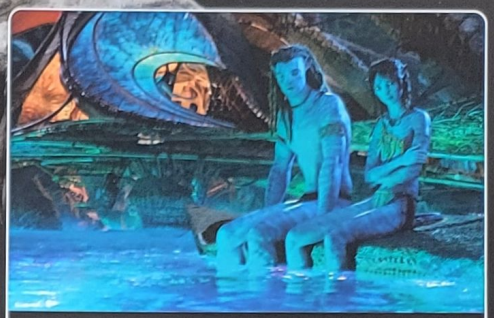
The Metkayina sleep in woven hammocks, which are generally uncovered and remain exposed to the elements. Using their expert weaving abilities, the clan has created a soft yet warm loose weave that is comfortable all year round. The Metkayina also take inspiration from watery reflections. When possible, woven textures are crafted to have a wavy, organic quality as if they are being viewed through a rippling ocean surface.

Walkway

SULLY FAMILY MARUI

Tension point supports walkway

Open totem shape for guests to feel welcome in spare marui



INSPIRED BY THE OCEANS

The Metkayina have a special and personal relationship with the Pandoran oceans. Clan members honor their marine environment in nearly all their constructions. Inspired by pebbles in the ocean that are worn over millennia, they create many smooth and spherical surfaces, which are strong and deflect water and wind.

Stripped and woven Pandoran flax and rattan

Transparent membrane allows in light and provides color

Rigid hoop used for shaping and tensioning marui

Bamboo fish pen

TONOWARI

PROUD, POWERFUL, AND RESPECTED by his people, Tonowari is the *olo'eyktan* of the Metkayina clan. He performs the same role as Jake Sully does for the Omatikaya clan, overseeing the secular well-being of his community. Tonowari exudes a fierce demeanor, and his clan respects him for his ideals and his ability to lead them through times of great challenge. Supported by his wife, *Tsahik* Ronal, he makes the difficult decision to provide *uturu* (sanctuary) to the Sully family, wrestling with the repercussions of what that choice ultimately means for his family and the Metkayina.

METKAYINA TATTOOS

Metkayina have striking tattoos, which are unique to each individual and chronicle their life. Each tattoo's location on the body carries a special meaning. Tattoos over the heart and chest symbolize the safe embrace of the central island. Arm tattoos represent the more exposed protective shield of the seawall. Thus, a hunter of the deep ocean has densely tattooed arms and less detail on their chest. The tattoos are considered a gift from both *Eywa* and the clan, and are created with inks from special animals. Tonowari, as *olo'eyktan*, has some of the most detailed and intricate tattoos of all the male Metkayina clan members. They range all over his face, torso, arms, and back.

Tightly braided hair for good vision above and below water

Symbolic tattoos showcasing life events

Akula-tooth mantle

Carved and hand-twisted iridescent shell armband with woven details

ARMBAND

Knife worn at hip for ease in unsheathing for battle or hunting

DATA FILE
SUBJECT Tonowari
SPECIES Na'vi
AFFILIATION Metkayina
HEIGHT 9 ft 7 in (2.92 m)

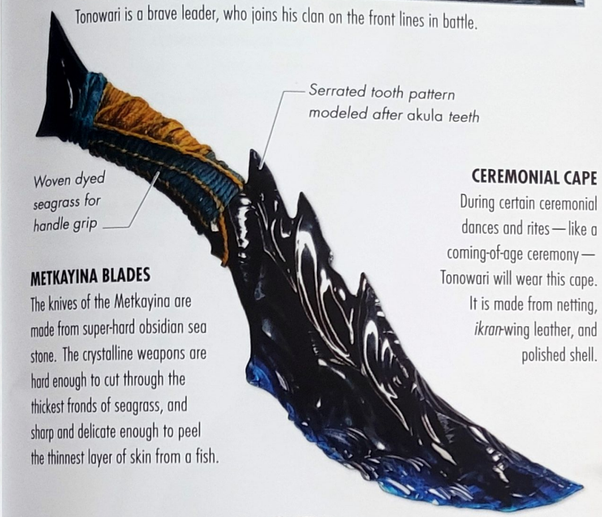
Tonowari is a brave leader, who joins his clan on the front lines in battle.

A small shell totem that Ronal could sing volumes about

SONGCORD

Serrated tooth pattern modeled after akula teeth

Woven dyed seagrass for handle grip



METKAYINA BLADES
The knives of the Metkayina are made from super-hard obsidian sea stone. The crystalline weapons are hard enough to cut through the thickest fronds of seagrass, and sharp and delicate enough to peel the thinnest layer of skin from a fish.

Macrame

Fish scales

CEREMONIAL CAPE
During certain ceremonial dances and rites—like a coming-of-age ceremony—Tonowari will wear this cape. It is made from netting, *ikran*-wing leather, and polished shell.

Highly colorful braided knots and rope

Delicate fish-scale leather weaving

Inset weaving from flax found in the reef's mangrove forest

IKNIMAYA

Much like Omatikaya teenagers, adolescent Metkayina must complete a number of coming-of-age rituals, known as *iknimaya*, before they are considered to be adult members of the clan. One of these ceremonies includes bonding with a *tsurak* (skimwing) and various tests with their *tulkun* spirit brother or sister. Once a Metkayina has completed these tests, they are bestowed with a special garment (left), their first tattoo, and three beads for their songcord.

Heavy leather waistband with leather fringe

FACT FILE

> Over many years, the Metkayina have crafted weapons and riding saddles designed for their oceanic environment.

> *Uturu* is a cultural code among the Na'vi. Safe haven must be offered to weary travelers who invoke it.

RONAL

RONAL IS THE FIERCE and independent *tsahik* (shaman) of the Metkayina clan. She is responsible for the spiritual needs of the entire clan, but is also an accomplished hunter and warrior and is willing to put everything on the line to protect her people. Ronal is married to Tonowari, and they have two children—Tsireya and Ao'nung—with another on the way. When Jake Sully and Neytiri come to the distant atolls to seek *uturu* (sanctuary), Ronal initially rebuffs them, unwilling to accept the reality of the coming war with the RDA and looking down upon the Sully family. Ronal does not believe that the Sully family—rainforest people—can earn their keep and find a way to live among the Metkayina.

Ronal leads the rest of her clan, including Tonowari, in an important ceremony.

Fine weave with iridescent shells

BATTLE ARMBAND

TEACHER AND LEADER

As Jake and Tonowari work together and the Sully children try to learn the ways of the Metkayina, Ronal spends her time with Neytiri instructing the Omatikaya *tsakarem* (*tsahìk* in training) in how to live harmoniously with the ocean.

Marine Dorado Verde leather headpiece

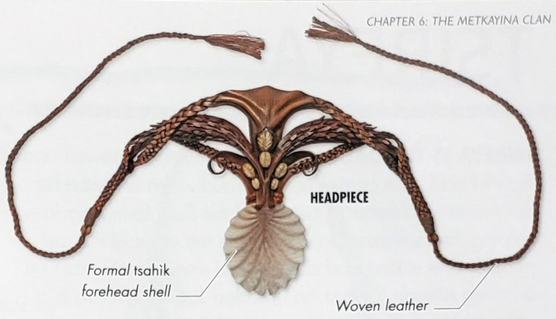
Tattoos denote family and rank

DATA FILE

SUBJECT	Ronal
SPECIES	Na'vi
AFFILIATION	Metkayina
HEIGHT	8 ft 7 in (2.62 m)

CEREMONIAL DUTIES

As *tsahik*, Ronal leads all ceremonies for the Metkayina clan. One of the more beautiful and empowering experiences is the First Breath ceremony where the whole clan is present for the "water birth" of a Na'vi baby under shallow water. Ronal assists the mother in guiding her newborn as it kicks to the surface to take its first breath, a symbolic transition from water to air. The Metkayina also share this ceremony with the *tulkun*. A *tulkun* mother will give birth to a calf at the same time, who will join the Na'vi baby in being welcomed by the community.



HEADPIECE

Formal tsahik forehead shell

Woven leather

Cascade of mother of pearl

Trinkets passed down between tsahiks over generations

MEDICINE POUCH

A leather roll containing herbs, puncturing quills, and medicine vials is used for healing.

A *TSAHÌK*'S NECKLACE

Ronal wears a particular kind of necklace that holds a small, needlelike knife. She uses this knife for various ceremonial purposes. This neckpiece is strung with delicate beads and hangs behind her ears, attached to her headpiece.

Shell protects tsahik knife

***TSAHÌK*'S SHELL**

Songcord integrated into her dress, symbolizing her connection to all her people

RONAL'S KNIFE AND SHEATH

Aquamarine sea crystal blade

Shell celebrates birth of Tsireya

METKAYINA SKIRT

This garment denotes her rank as tsahik. It is made from hand-dyed seagrass fronds, seashells, and reef-flower petals.

SWIMMING GARMENTS

SONGCORD

FACT FILE

> Even though she is *tsahik*, Ronal participates in all facets of clan life including hunting, gathering, and cooking.

TSIREYA

TSIREYA IS THE DAUGHTER of *Olo'eyktan* Tonowari and *Tsahik* Ronal. She carries herself proudly and is tasked by her mother and father to be one of the Sully family's guides, helping the rainforest Na'vi navigate the ways of the reef people. She is kind and patient, and immediately takes on a caring attitude toward the unsettled Tuktirey. Tsireya is a calm and inviting presence among the other more unwelcoming Metkayina clan members.

TSIREYA'S SONGCORD
There are several key life experiences and milestones woven into Tsireya's songcord, but many of the beads and trinkets she has included signify her appreciation of the people around her.

Mottled Metkayina skin patterns, different from Omatikaya Na'vi striping

A shell in the shape of a water drum from a First Breath ceremony

SMALL DROPLET HEADPIECE

Woven seagrass

ARMBAND

Inset shell

Woven handgrip

Reef macrame top

OCEAN TEACHER

After the Sully family are settled in their new Metkayina *marui* dwelling, Tsireya and some other young Metkayina invite the Sully kids into the water to explore the reef for the first time. With no diving experience, the rainforest children cannot swim deep and stay underwater, frustrating some of their hosts. But Tsireya understands that the Sullys need training and time to adapt. She helps the Sully children improve their breath-holding, diving, and swimming skills, and aids them in learning the Metkayina sign language.

Sea glass blade

KNIFE

PROVIDER
Tsireya takes great care of her knife. She regularly hunts with it and provides food for others. The better condition it's in, the healthier her clan.

Nictitating membranes allow perfect vision underwater

SHELL HEADPIECE

Seashell

Woven grass fronds

DURABILITY
Metkayina swim fast in the water; therefore, they have to make sure their clothes are well-secured to their body. Tsireya's headdress imparts totemic significance in its appearance, but is also meticulously woven to handle heavy currents.

DATA FILE

SUBJECT Tsireya
SPECIES Na'vi
AFFILIATION Metkayina
HEIGHT 7 ft 2 in (2.18 m)

Small seashells adorn Tsireya's clothing

SEA PRINCESS

Like Neytiri after Mo'at, Tsireya is expected to succeed Ronal as *tsahik*. As an acolyte, she assists her mother in medicinal procedures and rituals, including underwater ceremonies where she performs as a dancer. Her display of strength and agility symbolizes the interaction Reef People have with the power of water. She also teaches young Na'vi divers how to breathe with their diaphragms. It not only allows them to hold their breath longer when they swim but trains them to develop self-control under pressure—a characteristic of a strong Na'vi, and, in Tsireya's case, a mindful leader.

Forearm and lower leg "strake" fins aid swim stroke

Corded loincloth

Powerful, wide tail provides propulsion while swimming

CARVED SHELL NECKLACE
Natural fibers from the beach and underwater are harvested for weaving clothing.

Necklace is streamlined to reduce drag during swimming

AO'NUNG

AO'NUNG IS A CONFIDENT METKAYINA diver on the cusp of becoming an adult in the clan. The son of Ronal and Tonowari, Ao'nung is a skilled hunter who is looked up to by the other adolescent males. When the Sully family make their sudden and unexpected arrival at the reef, Ao'nung and his cohorts are initially surprised by the forest people's call for safe harbor. The surprise turns to anger and resentment when his parents instruct him to help the Sully children assimilate into the reef lifestyle.

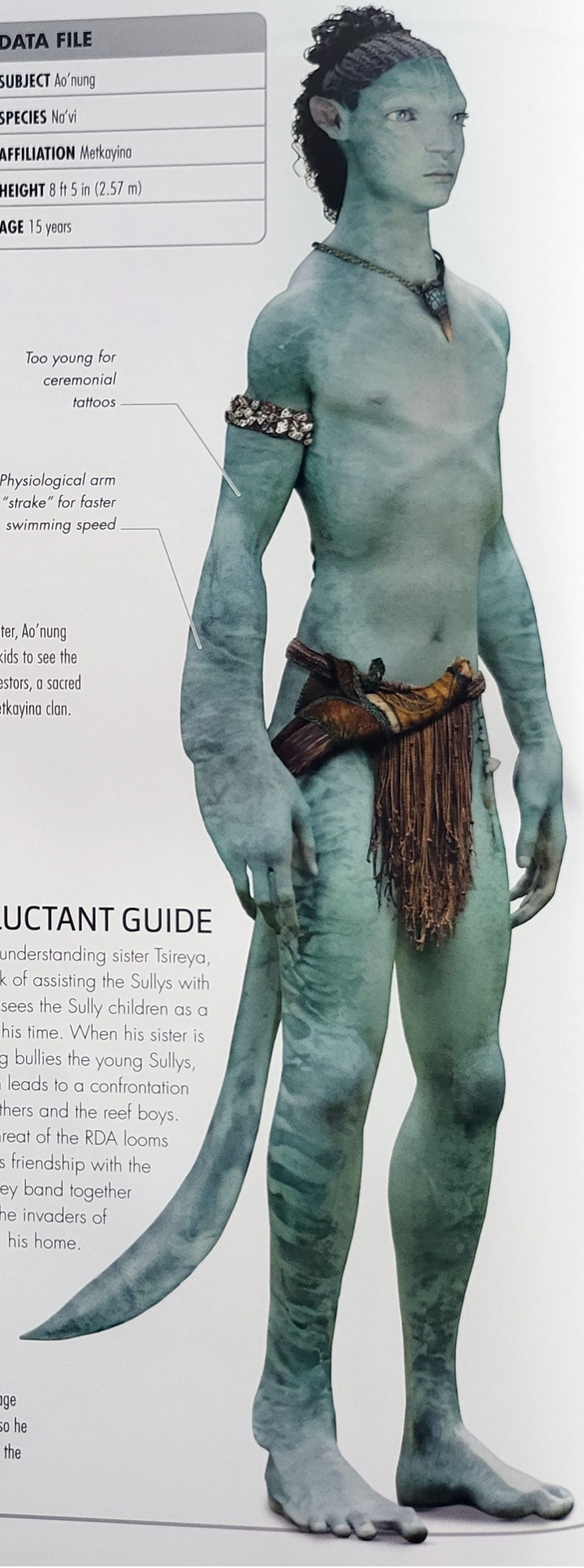
DATA FILE

SUBJECT Ao'nung
SPECIES Na'vi
AFFILIATION Metkayina
HEIGHT 8 ft 5 in (2.57 m)
AGE 15 years

Alongside his sister, Ao'nung takes the Sully kids to see the Cove of the Ancestors, a sacred place for the Metkayina clan.

Too young for ceremonial tattoos

Physiological arm "strake" for faster swimming speed



AO'NUNG'S BELT AND LOINCLOTH

RELUCTANT GUIDE

Unlike his patient and understanding sister Tsireya, Ao'nung views the task of assisting the Sullys with great displeasure. He sees the Sully children as a burdensome drain on his time. When his sister is not watching, Ao'nung bullies the young Sullys, especially Kiri, which leads to a confrontation between her brothers and the reef boys. However, as the threat of the RDA looms larger, Ao'nung finds friendship with the Sully children, and they band together as one to try to repel the invaders of his home.

WARRIOR IN TRAINING

Ao'nung has not passed the rites of passage for the Metkayina clan warrior class yet, so he does not wear the symbolic garment that the elder warriors and hunters of the clan do.

Skimwing jawbone blade

Seagrass cording-wrapped handle

AO'NUNG'S KNIFE

FISHER

The primary Metkayina source of protein comes from fish living in the shallows. Ao'nung typically uses a spear to impale the fish and his knife to fillet it. As cultural rule demands, he only takes from the ocean what he needs for his family and clan and never lets anything go to waste.

Hardened reef-nut shell used as necklace clasp

Sea hemp weaving

KNIFE SHEATH

Made from tanned surfstrider hide

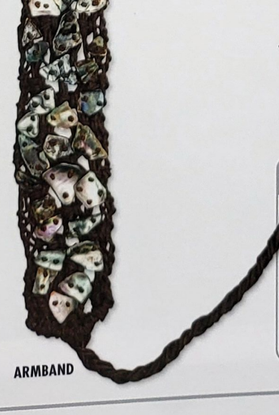
WEAVING

When collecting material for weaving, Ao'nung strips the fiber from nearby plants and dries the strands in the sun to make thread. Any adornments or decorations are fashioned from shells, plants, stones, and other elements from the reef environment.

Polished barnacles removed from underside of Tonowari's canoe

SONGCORD

Iridescent shell chips



ARMBAND

***ILU* PONY TOOTH TRINKET**

Reef bird talon wrapped in fish-scale leather

TALON NECKLACE

FACT FILE

> As part of his warrior training, Ao'nung will ride an *ilu* and work with it to drive away ocean predators that threaten the young of both their species.

> Ao'nung enjoys bodysurfing and plunge-diving through the reef wall tunnels during changing tides.

METKAYINA CANOES

THE METKAYINA DO NOT limit their mastery of weaving to their garments and *marui* homes. They also use it in the design of beautiful seafaring vessels. Every detail of their canoes is finely crafted, from the decorations on the bow, to the intricate, harp-like ropes that tension the outrigger to the hull. Although the main method of transportation for the Metkayina is the *ilu*, canoes serve a number of important functions. The vessels can carry a small family or be filled with items too heavy to load on saddles. They can also serve as spectator platforms during ocean rituals and ceremonies. At these sacred times, the canoes are adorned with flowers, an emotional spectacle that bonds the clan together.

DATA FILE

MANUFACTURER	Metkayina family
MODEL	Custom-made outrigger canoe
AFFILIATION	Metkayina
LENGTH	28 ft (8.53 m)
MAX SPEED	12 knots (14 mph/22 kph)
CREW	2–4 adults
WEAPONS	None

Seashells and other materials decorate bow

Paddles trained, not cut, from the mangrove-like trees that support the Metkayina homes

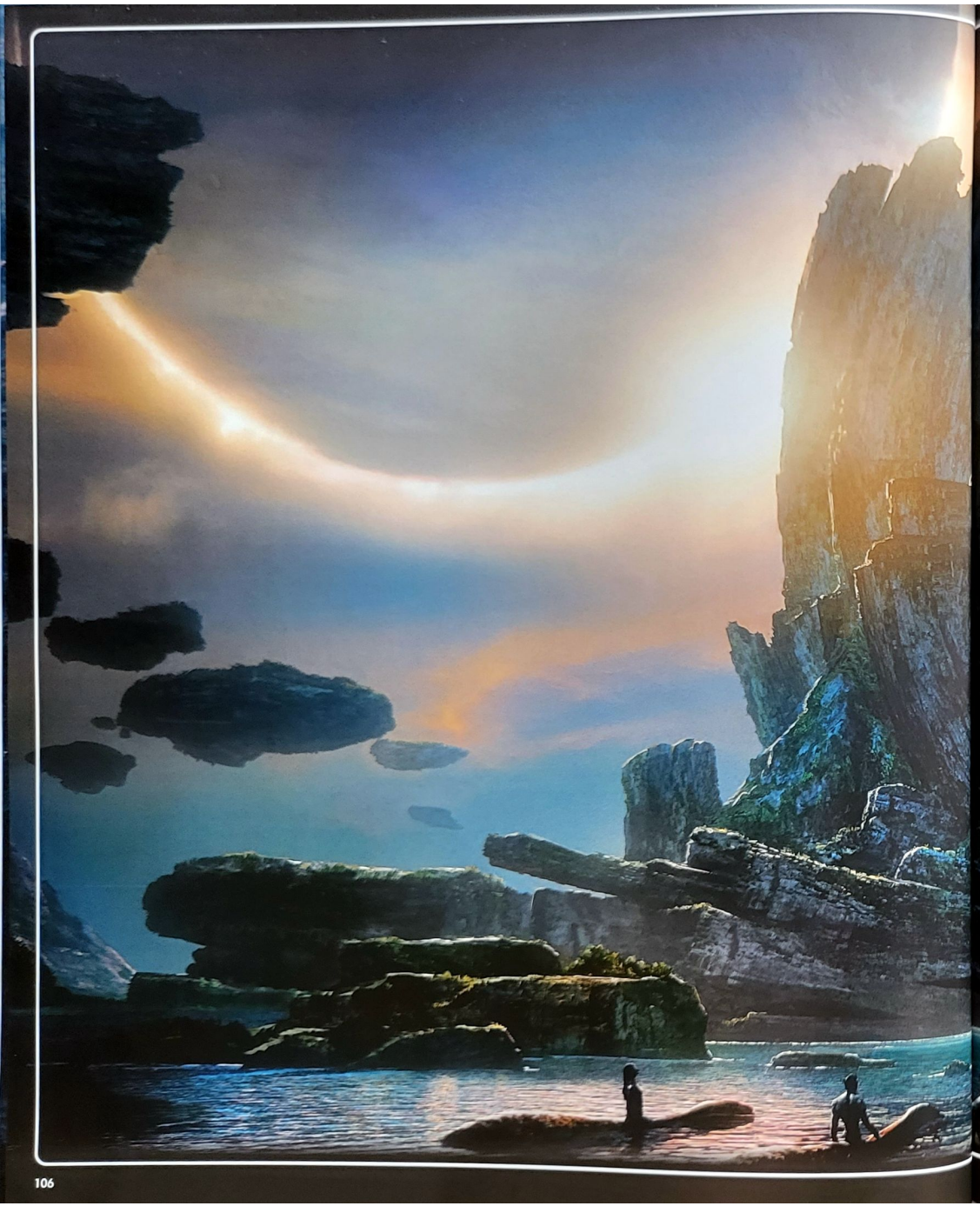
Outrigger for increased stability on open seas

CLAN SKILLS

As the Olangi clan lives in harmony with the direhorse, or the Tayrangi clan with the *ikran*, the Metkayina clan exists in harmony with the sea. When they are small children, all clan members learn how to navigate the lagoon in their family canoes. As they get older, they begin to explore the larger and more dangerous waters near the outer seawall of the reef. Canoe shapes and colors often display signature motifs of the Metkayina, providing a form of identification when they come across or visit another clan. This is one of the reasons why the Metkayina apply their finest craftsmanship to their canoes.

FAMILY VESSEL

Metkayina canoes come in a variety of sizes and styles. Each vessel belongs to one family who have lovingly crafted it to withstand the rigors of open ocean hunting and fishing. It can last many years, from a Na'vi's childhood to adulthood. By the time it is finally dismantled, it has gained so much sentimental value that a piece of it will be added to each member of the family's songcord.



COVE OF THE ANCESTORS

The Cove of the Ancestors is the sacred site of the Metkayina. It is one of several flux cons found on Pandora where there is an exceptionally strong magnetic field and strong concentration of unobtanium. The magnetic field is evidenced in the floating islands that are flux-pinned in space, above and below the water. These islands differ from the Hallelujah Mountains in that they are smaller and more horizontal in nature due to the different geology found here in the distant atolls. In addition to the limestone and unobtanium, there is a strong sandstone component that causes specific erosion, creating elaborate sea caves and more horizontal islands. The flux con is most dramatically apparent in the spectacular arching structure that radiates in a torus shape.

THE SPIRIT TREE

THE OCEAN NA'VI commune with their ancestors and connect with *Eywa* at their own special underwater Spirit Tree at the Cove of the Ancestors. Known in the Na'vi language as *Ranteng Utralti*, this towering yet delicate structure has a similar significance to the Reef People as the Tree of Voices (*Utraya Mokri*) or the Tree of Souls (*Vitraya Ramunong*) have to the Omatikaya clan of the rainforest. The Reef Na'vi attach to the Spirit Tree by intertwining their neural *kuru* to one of the many luminous, graceful fronds. The Spirit Tree provides oxygen through the *tsaheylu* bond, allowing long sessions connected underwater on a single lungful of air. Because they are underwater, the Na'vi are paired with a diving partner to watch over and monitor them while they enter a physically dissociated state of mind. Once connected, they can access *Eywa*'s neural network where they upload and view their own memories as well as interact with the stored "spirits" of their ancestors. The experience can be so emotionally impactful that afterward the Na'vi may require support from their diving partner to return to the surface.

EYWA

Eywa is the globally distributed consciousness of Pandora and the balancing and guiding force behind all its ecosystems. Considered a deity by the Na'vi, she works like a brain to ensure that the entire body of the moon is using its resources in as perfect a way as possible—a network that allows the species to live in harmony and balance with their environment. Therefore the "interconnectedness of all things," which on Earth is often viewed as a spiritual concept, exists in a physically tangible way on Pandora.

ZOOPLANTAE PHYLUM

On Pandora, there is an additional major phylum called "zooplantae" or animal-like plants. They are often carnivorous or saprophytic (living off other plants) and have something akin to a nervous system and muscles that allow them to move. The Spirit Tree is a member of this phylum. Instead of photosynthesizing, the Spirit Tree feeds on organic particles like zooplankton and krill—it is as much an invertebrate animal as it is a plant.

FROND
A single frond divides into several tendrils for the Na'vi to connect to.

FILTER
Special filters strain food particles from the surrounding water.

DATA FILE

NA'VI NAME *Ranteng Utralti*

HUMAN NAME Spirit Tree

LOCATION Cove of the Ancestors

FACT FILE

> Situated at the center of the Cove of the Ancestors, the Spirit Tree is protected from heavy sea currents.

> The Spirit Tree rises and expands with high tides and lowers and compresses with low tides.

CHAPTER 7:

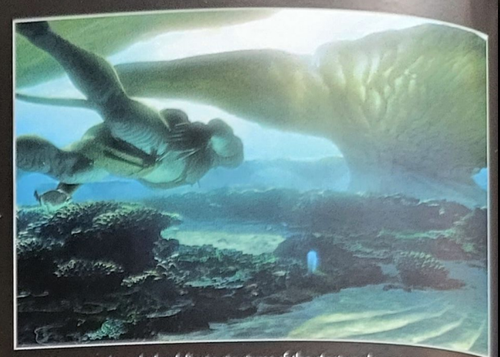
THE OCEAN

Much like the Omatikaya rainforest, the oceans surrounding the Reef People's atolls are teeming with fascinating animals and plants of different types and sizes. The Metkayina rely upon the sea for every resource, and it is also home to their most sacred site under the sea, where they can connect with *Eywa*. Members of the clan ride and swim with the playful *ilu*, and some take part in open-sea hunts on the backs of sleek skimwings. Fearsome *akula* are the apex predators of the food chain and represent a massive threat; the Metkayina can only hope to drive them away. Sentient whale-like creatures called *tulkun* also dwell in the sea and are deeply connected to the Metkayina, who see them as siblings and part of their clan. RDA scientists have just begun to study Pandora's sea life, but, unfortunately for the *tulkun* and reef Na'vi, human scientists have discovered an extremely valuable, harvestable material inside the *tulkun* brain.

ANEMONES AND CORAL

THE UNDERWATER REEF supports a symbiotic relationship among anemones, corals, flora, and algae. The mutual activities of the different species—oxygen exchange, photosynthesis, fertilization, and waste removal—enable the reef to thrive and grow. The branchwork of the coral structures is a visual metaphor for the interconnectivity between the reef species, and also resembles *Eywa*'s organizing principle of a fractal network: a circulatory system that maintains balance and stability. The reef's health is exhibited by the variety of anemone and coral shapes, sizes, and colors, and by the abundant biodiversity, which scientists believe to be unparalleled in any known ecosystem in the universe.

All sea life on the reef co-evolved over hundreds of millions of years, making it one of the oldest and most successful habitats on Pandora.



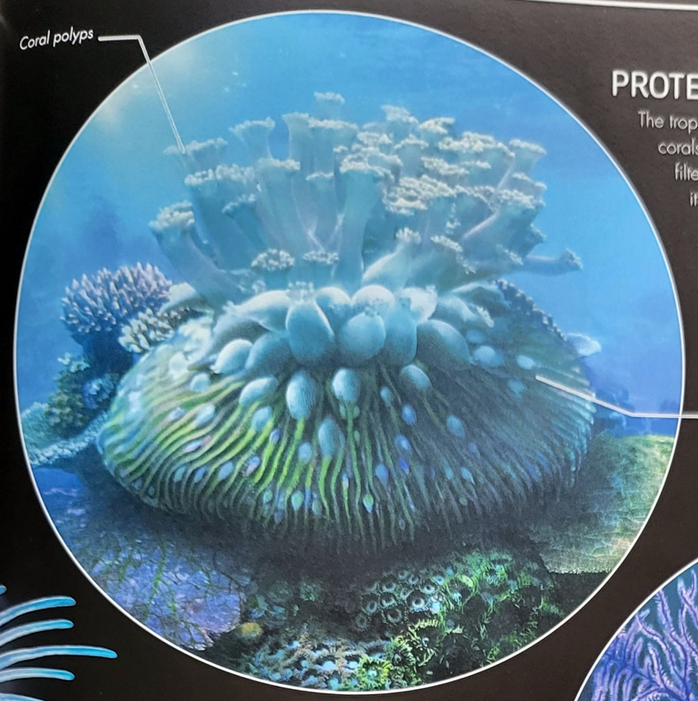
Sunlight passes through the delicate structures of the giant mushroom coral and provides solar energy to the symbiotic algae within.

ELEMENT OF SURPRISE

The daisy anemone is a fish-eating anemone that captures unsuspecting prey with its strong tentacles. It relies on electrolocation to sense the bioelectric fields discharged by certain types of large predator fish. The anemone can also lure prey by mimicking the signals that fish species use to attract a mate. Once the fish swims within reach, the daisy anemone quickly extends its column and wraps its tentacles around the prey, injecting paralyzing venom before moving it into its mouth and breaking down its body with digestive enzymes. While dangerous to large predator fish, smaller fish often find protection and safe haven alongside it.

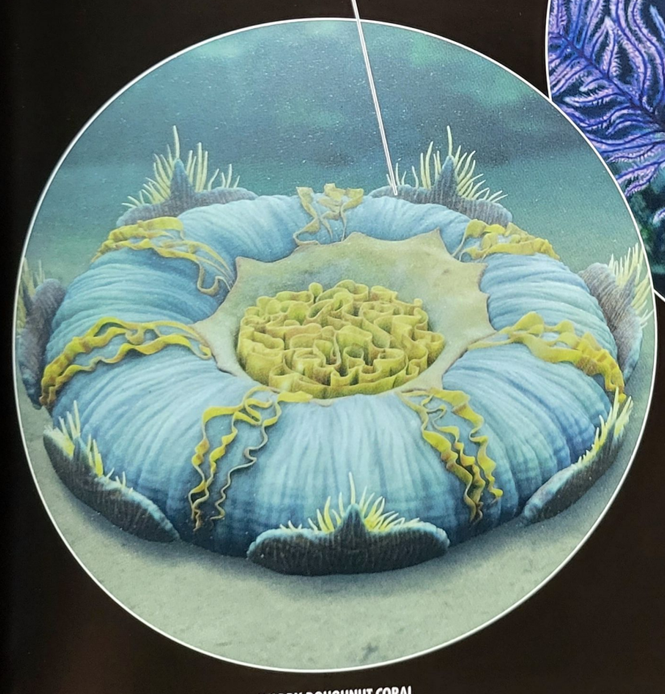
PROTECTORS OF LIFE

The tropical seafloor is a habitat for soft and stony dendritic corals, fan corals, and brain corals that are designed to filter underwater. This helps keep the ocean clean and its gas concentration under control. The corals also grow into colonies large enough to buffer and slow down water currents, protecting islands and coast lines from powerful waves and sea-level rises. Without them, the reef would become uninhabitable for all life forms.



NOM'S DELIGHT CORAL

FANTAIL CORAL



STARRY DOUGHNUT CORAL

ILU

***ILU* ARE SMART, PLAYFUL,** deadly, and fast. They are streamlined, graceful swimmers, capable of impressive hydrobatics and almost dance-like choreography while hunting as a pack. These airbreathing creatures inhale through two nostrils in the top of the skull and exhale through multiple exhaust ports (spiracles) along the base of the neck. Marine Na'vi ride *ilu* just as the Omatikaya ride *pa'li* (direhorses), by connecting with them using their neural whips (called *kuru*) in a *tsaheylu* bond. *Ilu* are intelligent and highly social, like dolphins. They often leap exuberantly out of the water in a corkscrewing spin, or surf behind the faces of large waves in tidal bores.

Ilu enjoy working collaboratively with their Na'vi riders to drive away predators that threaten the young of both species. It is a symbiotic cooperation that serves both Na'vi and *ilu*.

Kuru can supply oxygen to a Na'vi diver, allowing much longer submersion

Kuru extend from rear of skull

Fin (one of six)

Special organs in head and neck generate high-frequency sounds for echolocation and long-range underwater communication

Four eyes: one larger pair, one smaller pair

TOP VIEW

Head can be raised out of water for spotting and for social behavior

SIDE VIEW

Long, muscular neck allows ilu to plunge into swarms of fish before prey feel the pressure wave of the main body

DATA FILE

NA'VI NAME *Ilu*
HUMAN NAME Jiaolong; sirens; Deltaptera nessiformes sirenides ("triangle-wing Nessie-shaped")
SIZE 6.5–49 ft (2–15 m); average size 23 ft (7 m)
SPEED 32 knots (37 mph/60 kph)
LIFESPAN 55–60 years

Sleek, streamlined body and camouflage markings

FACT FILE

DIET
Small fish and mollusk-like crustacean creatures found on the sea bed.

HABITAT
Ilu range in the ocean waters of the Pandoran eastern seas.

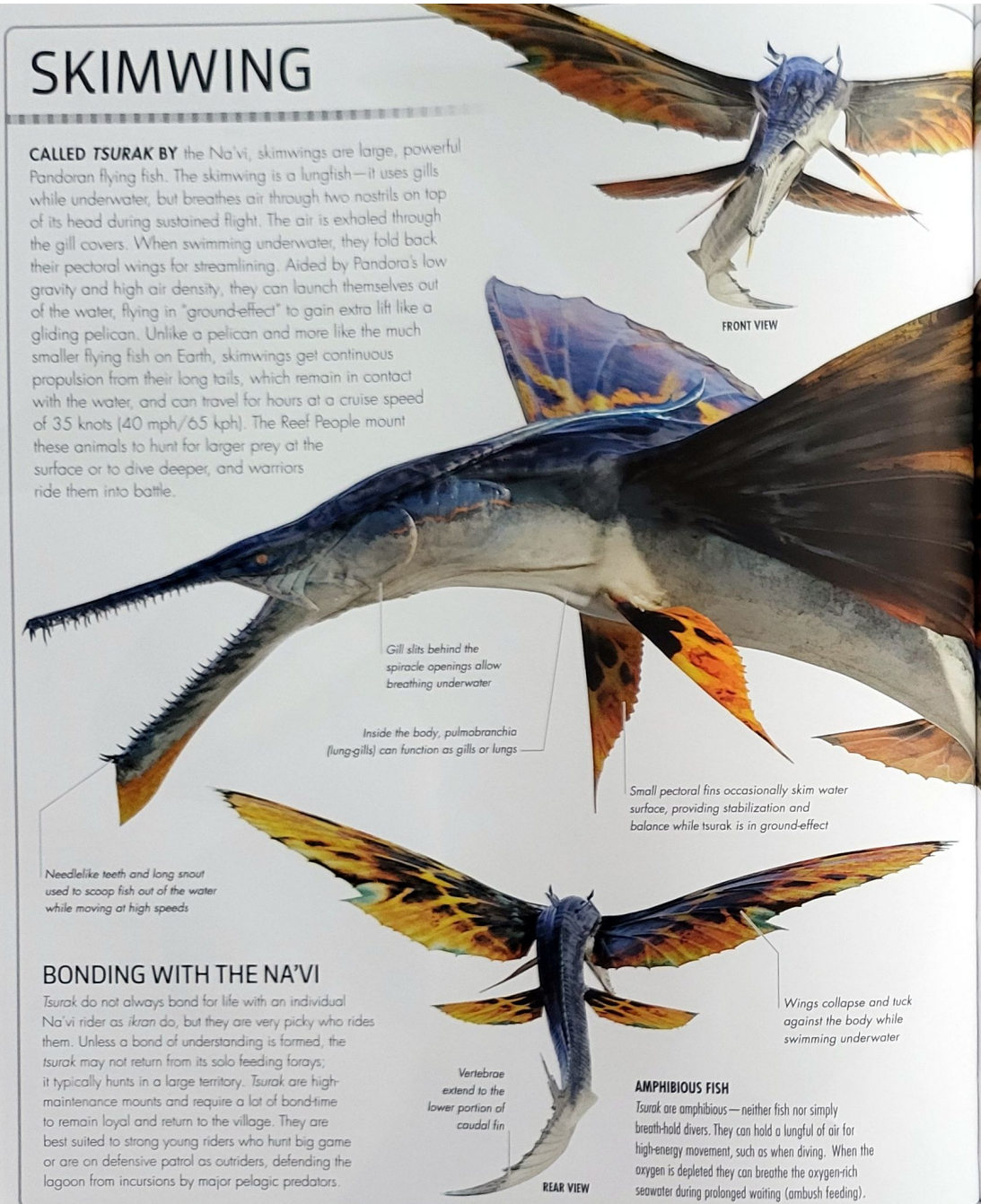
Rudder-like tail

DOMESTICATED *ILU*

Ilu are easily domesticated, and groups often come to live adjacent to Na'vi reef settlements or travel with ocean nomads. They adopt the territory of their Na'vi partners, and act as a warning system when large predators approach. During initial bonding, the Na'vi rider must force the creature to go slowly or they can be pulled off by water drag. If they succeed in riding the animal, they rig it with a harness so they can hold on better, and to help carry weapons. *Ilu* do not develop individual imprinted bonds with riders, so any competent rider can mount any *ilu* that has been familiarized with the *kuru* bond.

SKIMWING

CALLED *TSURAK* BY the Na'vi, skimwings are large, powerful Pandoran flying fish. The skimwing is a lungfish—it uses gills while underwater, but breathes air through two nostrils on top of its head during sustained flight. The air is exhaled through the gill covers. When swimming underwater, they fold back their pectoral wings for streamlining. Aided by Pandora's low gravity and high air density, they can launch themselves out of the water, flying in "ground-effect" to gain extra lift like a gliding pelican. Unlike a pelican and more like the much smaller flying fish on Earth, skimwings get continuous propulsion from their long tails, which remain in contact with the water, and can travel for hours at a cruise speed of 35 knots (40 mph/65 kph). The Reef People mount these animals to hunt for larger prey at the surface or to dive deeper, and warriors ride them into battle.


FRONT VIEW
Gill slits behind the spiracle openings allow breathing underwater
Inside the body, pulmobranchia (lung-gills) can function as gills or lungs
Small pectoral fins occasionally skim water surface, providing stabilization and balance while tsurak is in ground-effect
Needlelike teeth and long snout used to scoop fish out of the water while moving at high speeds
Wings collapse and tuck against the body while swimming underwater
Vertebrae extend to the lower portion of caudal fin
REAR VIEW

BONDING WITH THE NA'VI

Tsurak do not always bond for life with an individual Na'vi rider as *ikran* do, but they are very picky who rides them. Unless a bond of understanding is formed, the *tsurak* may not return from its solo feeding forays; it typically hunts in a large territory. *Tsurak* are high-maintenance mounts and require a lot of bond-time to remain loyal and return to the village. They are best suited to strong young riders who hunt big game or are on defensive patrol as outriders, defending the lagoon from incursions by major pelagic predators.

AMPHIBIOUS FISH

Tsurak are amphibious—neither fish nor simply breath-hold divers. They can hold a lungful of air for high-energy movement, such as when diving. When the oxygen is depleted they can breathe the oxygen-rich seawater during prolonged waiting (ambush feeding).

Each tsurak's colorful wing pattern is unique to the individual

DATA FILE	
NA'VI NAME	*Tsurak*
HUMAN NAME	Skimwing; Ichthyopterix volans (flying fish-wing)
SIZE	48 ft (14.6 m)
MAX SPEED	50 knots (58 mph/93 kph)
LIFESPAN	20 years

Wings unfurl in accordion-like fashion when above water

Thin, colorful membranes of skin webbed between strong, tensile cartilaginous spines

Fins tuck into sides when diving underwater, allowing skimwing to form sleek torpedo shape

Atop a skimwing, Jake is ready to fight the RDA's forces. These flying fish are difficult to tame and ride, and are for strong and advanced riders only.

Smaller pelvic fins act like horizontal stabilizers on an airplane

FACT FILE

DIET
Mostly fish and small aerial creatures.

HABITAT
Open oceans and lagoons of Pandora, but can be found close to the shore near the Metkayina village.

FACT FILE

> On the evolutionary scale, the skimwing is halfway between a fish and an *ikran* (mountain banshee). In fact, skimwing and *ikran* share a common ancestor.

> Unlike a dolphin or whale, skimwings cannot drown.

RIGHT SIDE VIEW

Large, powerful caudal fin provides thrust underwater and while gliding on the surface

REEF FISH

THE REEFS OF PANDORA are some of the most biodiverse regions on the moon, hosting a staggering variety of amazing sea life, including countless species of reef fish. With their brilliant colors, fantastic patterns, and strange shapes, these fish blend in with the vibrant coral reef. Fish are an important primary food source for the Metkayina, and fishing is an integral part of their culture. Fishers are highly respected, frequently being depicted in Metkayina artwork and regarded as heroes in their proverbs and stories.

Rectangular head extensions aid avoidance of larger predatory fish

Several sets of valve-like pits enable filtration and extraction of oxygen from water

HAMMERBROW FISH
The hammerbrow is a small, colorful fish that schools in small groups of up to a dozen. One of its distinct physical features is a pair of large, rectangular extensions at the top of its head. These are believed to help the fish detect subtle disturbances in the surrounding water, allowing it to evade would-be predators.

GLIDER FIN

A tiny shallow-water fish usually found in schools of several hundred, the glider fin is what is known as a forage fish: a common and numerous prey fish that supports much of the food chain above it. Many larger fish, Pandoran marine birds, *ilu*, and other ocean fauna rely heavily on the glider fin as a primary food source, making it a keystone species of the reef ecosystem. Its natural lifespan is about a year, although many are eaten as prey before completing their life cycle.

FACT FILE

DIET
Glider fin feed mostly on microscopic plankton-like marine animals.

HABITAT
The fish is found in shallow waters along the coastlines of Pandora, occasionally venturing into the open ocean, and migrating between different regions in search of food.

Intricate patterns can be found on even the smallest of Pandoran fish

SURVIVAL TACTICS
Glider fish are commonly eaten before they are able to reproduce. To make up for this, those that do survive can lay as many as 200,000 eggs. This is an important way of replenishing the ecosystem's food supply.

Brightly colored stripes aid camouflage in colorful coral reef

Wide "monofin" flaps in a fluid wavelike motion, propelling fish slowly through water

Large tusks used for catching prey and battling other pincer fish

PINCER FISH
The graceful pincer is a small, predatory fish that is harmless to Na'vi but can be quite dangerous to fish smaller than itself. It sports two large, bony tusks that are not only used to herd smaller prey toward its mouth, but are also perfect for jousting matches with other pincers to settle territorial disputes.

Single tail fin provides much of the thrust for swimming

Tusks can dig through sand in search of crustaceans

Patterns on sides of fins are slightly iridescent

FEATHERTAIL FISH
A fish that is more tail than body, the feathertail derives its name from the signature long, rounded tail fin. Like the glider fin, the feathertail is an important prey animal within the reef ecosystem, providing food for many other reef denizens. It is never eaten by the Metkayina, however: to them, its flesh tastes horribly bitter.

Long, powerful tail fin allows fish to "sprint" for short periods of time in order to avoid being eaten

Two sets of eyes for enhanced spectral range

Long, winglike fins produce birdlike flying motion underwater

Split tail fin propels fish in a kicking motion

Upper half of split tail fin is larger than lower half

FLAT SKATE FISH
The flat skate is a vibrantly colorful fish that is considered a delicacy by the Metkayina when cooked. It is a very fast swimmer, however, making it difficult to catch except by the most experienced fishers.

GILL MANTLE

THE GILL MANTLE is a graceful, diaphanous, semitransparent marine invertebrate found throughout Pandora's oceans. It is of particular value to the reef Na'vi, who use it to extend their time underwater. Once a Na'vi bonds with a gill mantle, the creature acts as a sort of external gill, feeding oxygen to the bonded Na'vi through their *kuru* connection. In fact, the Metkayina name *txampaysye* translates roughly to "sea breather" in English.

WING-LIKE FINS

A large proportion of the gill mantle's body is made up of several pairs of delicate, translucent fins. Human observers have sometimes compared the shape of these fins to butterfly wings or even artistic depictions of angel wings. The resemblance is especially noticeable when the creature has bonded with a Na'vi diver and is resting along its companion's back. The fins appear as if they are gracefully sprouting out of the back of the Na'vi and "flapping" in the currents of Pandora's oceans like wings.

UNUSUAL ANATOMY

The gill mantle has not evolved a traditional respiratory system. Instead, its entire body acts as a sort of underwater "lung," diffusing oxygen from the water around it through its epidermis. Scientists have hypothesized that the gill mantle co-evolved symbiotically with the ocean Na'vi, who protect them and transport them throughout the oceans—giving them a wide distribution and access to the best grazing sites.

Slow movement makes the gill mantle vulnerable to larger carnivorous animals such as akula and skimwing

Small enzymatic receptors along body emit low-level bioluminescent light

Smaller forefin

Relatively small main body contains mouth, brain, and other vital internal organs

Larger hindfin

Tentacle-like arm (one of six) that extends from main body and is used to grip onto the back of a bonded Na'vi

Smaller prey animals are paralyzed by stinging tentacles as gill mantle slowly drifts through water

Stinging tentacles are essentially harmless to Metkayina, who over many generations have developed immunity

Tentacles lined with hundreds of microscopic stinging organs

DATA FILE

- **NA'VI NAME:** *Txampaysye*
- **HUMAN NAME:** Gill mantle
- **HEIGHT:** 6.5–10 ft (2–3 m)
- **WINGSPAN:** 5–8 ft (1.5–2.5 m)
- **TOP SPEED:** 5 mph (8 kph)
- **LIFESPAN:** 1–5 years

FACT FILE

DIET

The gill mantle is omnivorous, feeding mostly on microscopic plankton-like organisms and small fish.

HABITAT

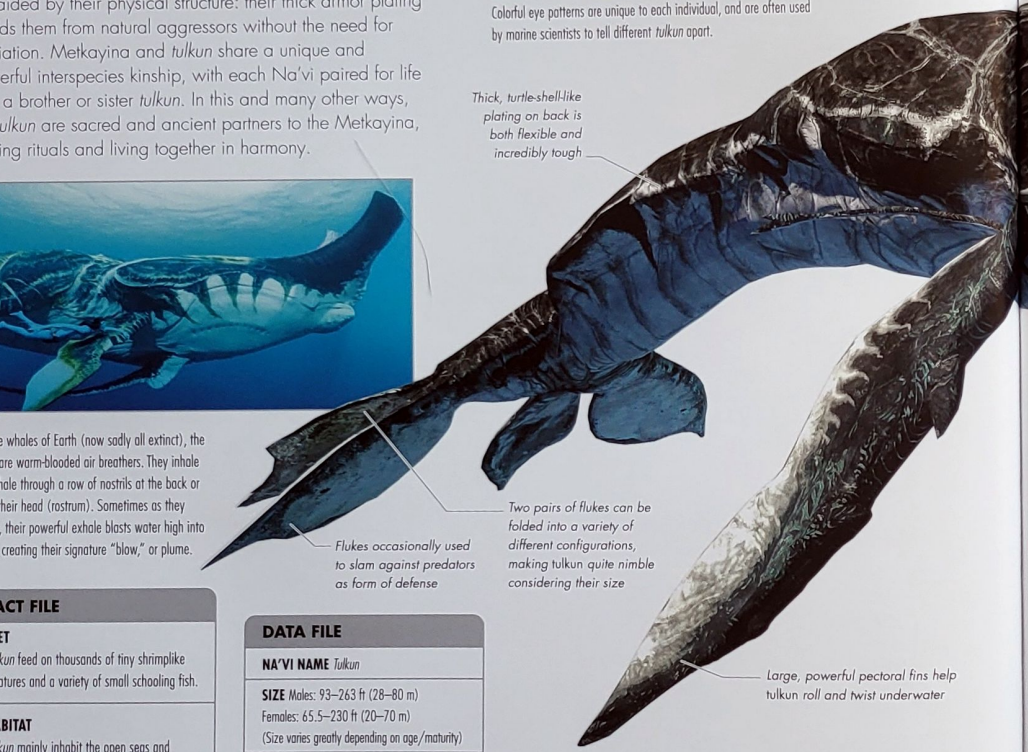
The creature is found at a variety of depths, but most often fairly close to the surface of the water.

TULKUN

***TULKUN* ARE A RACE OF** enormous, highly intelligent sea-dwelling creatures. With intellect and cultural development equal to the Na'vi, *tulkun* possess not only names and rich family histories, but also sophisticated music and poetry. After eons of bloody warfare among their social groups, *tulkun* turned away from violence and are collectively sworn to a life of absolute pacifism. Their moral principles are aided by their physical structure: their thick armor plating shields them from natural aggressors without the need for retaliation. Metkayina and *tulkun* share a unique and powerful interspecies kinship, with each Na'vi paired for life with a brother or sister *tulkun*. In this and many other ways, the *tulkun* are sacred and ancient partners to the Metkayina, sharing rituals and living together in harmony.

Colorful eye patterns are unique to each individual, and are often used by marine scientists to tell different *tulkun* apart.

Like the whales of Earth (now sadly all extinct), the *tulkun* are warm-blooded air breathers. They inhale and exhale through a row of nostrils at the back or top of their head (rostrum). Sometimes as they surface, their powerful exhale blasts water high into the air, creating their signature "blow," or plume.


Thick, turtle-shell-like plating on back is both flexible and incredibly tough
Two pairs of flukes can be folded into a variety of different configurations, making tulkun quite nimble considering their size
Flukes occasionally used to slam against predators as form of defense
Large, powerful pectoral fins help tulkun roll and twist underwater
Sensor crests are larger in males, and are believed to be used in courtship displays
Powerful flukes provide thrust
Trifurcated jaw hinges in three parts to allow ingestion of massive schools of tiny creatures

ADULT *TULKUN* BULL

FACT FILE

DIET
Tulkun feed on thousands of tiny shrimplike creatures and a variety of small schooling fish.

HABITAT
Tulkun mainly inhabit the open seas and oceans, but they sometimes enter the Metkayina lagoon through the underwater tunnels in its reef.

DATA FILE

NA'VI NAME *Tulkun*

SIZE Males: 93–263 ft (28–80 m)
Females: 65.5–230 ft (20–70 m)
(Size varies greatly depending on age/maturity)

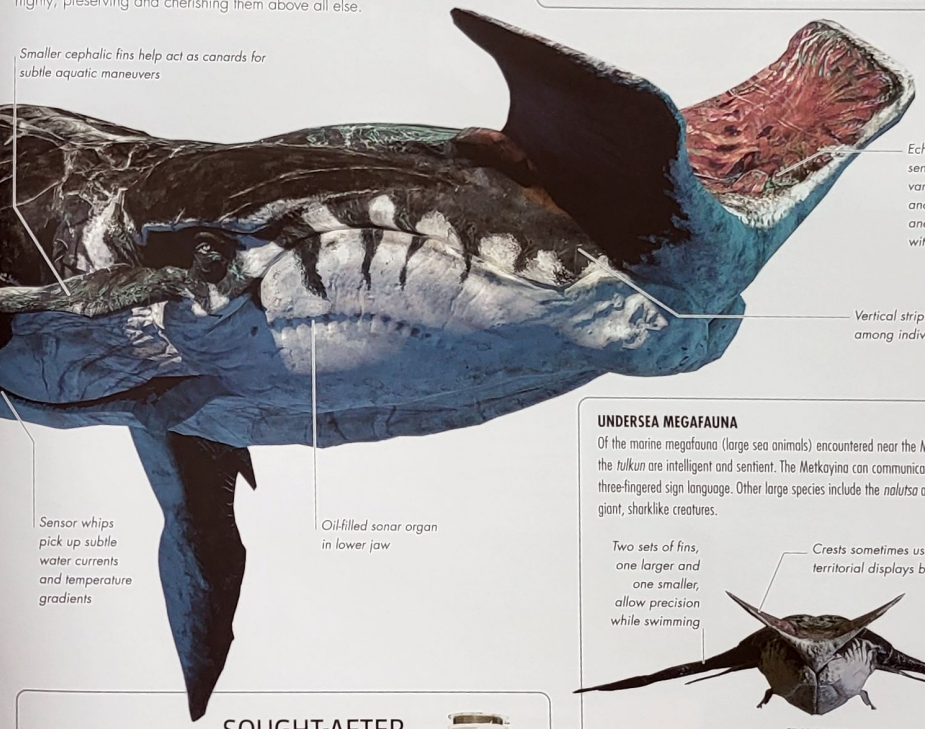
SPEED 22 knots (25 mph/40 kph)

LIFESPAN 150–250 years

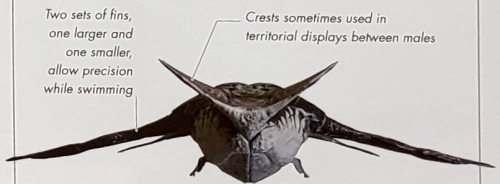
TULKUN TOTEMS

Tulkun have become the totem animal for the Metkayina. Their forms are mimicked in ornamentation throughout Metkayina culture. Large, woven wall panels depicting the *tulkun* are built into Metkayina *marui* (homes) to honor their bond. While many parts of their dwelling structures may be damaged and repaired, the Metkayina revere these panels highly, preserving and cherishing them above all else.

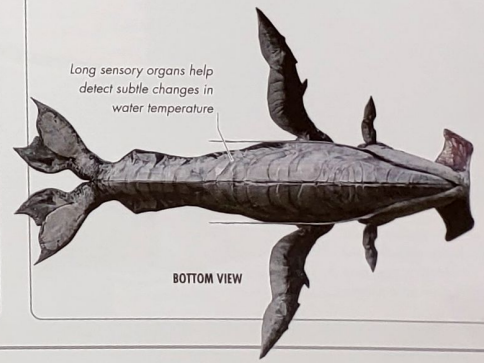
TULKUN DISPLAY
When the *tulkun* pod returns to its reef home, the creatures partake in the return ceremony. As part of this ceremony, the calves are recognized as adults and the Metkayina give them ceremonial tattoos.


Smaller cephalic fins help act as canards for subtle aquatic maneuvers
Echolocation sensor crests are variously colored and patterned, and grow in size with age
Vertical striping pattern varies among individual tulkun
Sensor whips pick up subtle water currents and temperature gradients
Oil-filled sonar organ in lower jaw

UNDERSEA MEGAFAUNA
Of the marine megafauna (large sea animals) encountered near the Metkayina reef, only the *tulkun* are intelligent and sentient. The Metkayina can communicate with them using three-fingered sign language. Other large species include the *nalutsa* and the *akula*, two giant, sharklike creatures.


Two sets of fins, one larger and one smaller, allow precision while swimming
Crests sometimes used in territorial displays between males

FRONT VIEW



BOTTOM VIEW

SOUGHT-AFTER SUBSTANCE

While dissecting a *tulkun* study subject, RDA marine biologist Ian Garvin made a momentous discovery. He found a naturally occurring substance in the *tulkun*'s brain that has the medical power to stop human aging. The substance, known as *amrita*, can be extracted from dead *tulkun* using a specialized drill deployed from the SeaDragon ship, which now hunts the large marine animals in Pandora's oceans.

Amrita stored within RDA containment vial

TULKUN CALVES

EACH YEAR, ON A CERTAIN DATE, hundreds of *tulkun* and their calves congregate near the Metkayina village at the hallowed Cove of the Ancestors. Here, all the new calves born within the last year are brought to the Spirit Tree for their first connection to *Eywa*. This Calf Communion ceremony is attended by the *tulkun* pod's Metkayina "brothers and sisters," who also bring their own young to bond with the global neural network. The event is sacred to both *tulkun* and Metkayina and is a deep part of their shared culture. The spectacle of innumerable *tulkun* and Na'vi babies arrayed around the sacred underwater tree is surely one of Pandora's true wonders.

DATA FILE

SPECIES *Tulkun* calf	
LENGTH (average) 34.5 ft (10.5 m)	
SPEED 22 knots (25 mph/40 kph)	
CALFHOOD 10 years	

TULKUN KURU

Newborn *tulkun* calves receive oxygen and nutrients through the mother's *kuru*. The *kuru* is a highly important organ to all higher Pandoran animals: it not only carries "data" in the form of neural signals, but also can enlarge to carry oxygen and nutrients through its veins and arteries. Triggered by hormones, a female Na'vi or *tulkun*'s *kuru* will enlarge to sustain the life of a newborn. The tendrils at the end of a *kuru* thus create an interface that is part USB-port, part placenta.

AGILE SWIMMERS
Tulkun calves are amazing swimmers, and just as nimble underwater as their parents.

BIRTH TO MATURITY

Tulkun reproduce approximately every two to three years. Gestation is about 18 months, and the *tulkun* always give birth to a single calf at a time. Calves stick close to their mothers for the first few years of their lives, a crucial time in their development for social bonding. After these early years calves become more independent, although full physical maturity is not reached until around 10 years of age.

Sensor crests are barely visible during infancy and begin to mature during adolescence

FRONT VIEW

Kuru connection to the spirit tree begins within first year of life

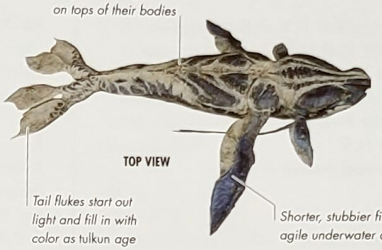
Calves have a higher percentage of body fat than their leaner adult parents

SIDE VIEW

PATTERNS FOR CAMOUFLAGE

The markings on *tulkun* adults are relatively drab, but calves have colorful patterns, usually in a range of rich blues, purples, and cyans. Light-colored patches help to give the effect of dappled light against the ocean floor, allowing the calves to blend in with their environment. Calves are relatively small when they are first born, so they remain vulnerable to large predators for many years.

Unlike adults, calves have many light-colored patches on tops of their bodies

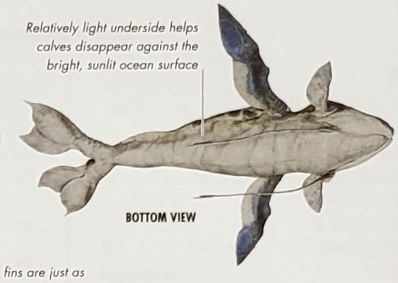


TOP VIEW

Tail flukes start out light and fill in with color as tulkun age

Shorter, stubbier fins are just as agile underwater as adult fins

Relatively light underside helps calves disappear against the bright, sunlit ocean surface



BOTTOM VIEW

LISTENING DEVICES
An array of sensitive sensor pits on the underside of the tulkun's crest gives the creatures their acute sense of hearing.

NEURAL WHIPS
In the tulkun, kuru are located inside the mouth because newborn calves are sheltered from predators inside their mother's mouth for the first few months of life.

NATURALLY PLAYFUL
Calves are playful and gregarious by nature, and can often be seen exuberantly frolicking around their mothers.

FACT FILE

> Calves grow rapidly within the first 10 years of their lifespans. *Tulkun* continue to grow more slowly throughout the rest of their lives, so elder *tulkun* are larger than young adults.

> *Tulkun* calves are physically much smaller than adults, but, within the first few months of their lives, can swim almost as fast as mature *tulkun*.

INDEX

A

amnio-tank 36, 37, 68
Amp Suit 43, 44, 48, 55, 58, 70, 84
amrita 44, 62, 63, 76, 123
anemones 112
Ao'nung 102–103
AR cleaning kit 27
Ardmore, General Frances 9, 41, 44, 60–61
armband
  Metkayina 18, 96, 98, 100, 103
  Omatikaya 12, 13, 15, 16, 17, 19, 20, 21, 22, 33, 35
atolls 92–93
Augustine, Dr. Grace 11, 18, 19, 36, 37, 63
avatars 18, 19, 26–27, 35, 36, 38–39
AVTR Program 13, 33, 34, 35, 37, 38
ax 12

B

baskets 30, 31
Big Quad 57
biolab *see* High Camp biolab
blimp 55
bow and arrow 16, 21, 32
bracelets and cuffs 15, 19, 21, 23
braids
  clothing and ornaments 12, 18, 22, 97
  hair 32, 69, 96
breathing equipment 32, 34, 36, 72
Bridgehead City 41, 44–47, 75, 84
  construction 54–57
  Ops Center 48–49
  shipyard factory 52–53

C

canoes 104–105
Cet-Ops 60, 75, 85
  flying vehicles 86–89
  ocean craft 76–83
Chunker 80
comms equipment 13, 16, 64, 73
CON-DEV 46, 48, 54, 56, 57
corals 112–113
Cove of the Ancestors 102, 106, 107, 124
Crab Suit 84–85
crane 54, 55
cummerbund, Omatikaya 16, 20

D

datapad 34, 63, 64
direhorse 16, 23, 35
"Dream Hunt" 20

E

Expeditionary Force 9, 44, 60
Eywa 14, 15, 18, 46, 69, 93, 96, 106
  Eywa Network 36

F

feathertail fish 119
field research equipment 35, 63
First Breath ceremony 99, 100
flat skate fish 119
Flux Vortex 28

G

Garvin, Dr. Ian 63, 76, 77, 123
gill mantle 120–121
glider fin 118
grenades 58, 70, 72, 80
guns 13, 58, 60, 65, 68, 70, 71, 73, 79, 89

H

Hallelujah Mountains 13, 26
  Battle of the 12, 32, 34, 38
hammerbrow fish 118
hammocks 27, 28, 31, 94
harpoons 78, 79, 82, 83,
Hauler 56
headband 14
headpiece 98, 99, 100, 101
headset 36
Hell's Gate 12, 14, 23, 32, 33, 34, 35, 44
hexapede 20, 31
Hexbot 56
High Camp 13, 26–29
  biolab 19, 27, 36–39
Holofloor 48, 49, 51
Hometree 12, 16, 26

I

IFF (Identification/Friend or Foe) transponder 64, 65
iknimaya 97
ikran 13, 15, 16, 18, 20, 23, 26, 36, 29, 105
ilu 21, 22, 103, 104, 114–115
Interstellar Vehicle (ISV) 42, 45
ISV *Vindicator* 68

K

Kestrel 48, 88–89
kill zone 45, 46
Kiri 11, 18–19, 20, 21, 102
knives
  Metkayina 96, 97, 99, 100, 103
  Olangi 35
  Omatikaya 12, 15, 17, 19, 20, 21, 23, 32
  RDA 33, 62, 63, 65, 71, 73
kuru 14, 69, 106, 114, 115, 120, 124, 125

L

Landing Module 42–43, 44
leg bands and anklets 14, 16, 19, 23
link bay 38–39
Lo'ak 11, 20–21
loincloth 14, 18, 21, 22, 23, 101, 102

M

Mako submersible 76, 82–83
Manifest Destiny 44
marui
  Metkayina 94–95, 104, 123
  Omatikaya 25, 27, 28–29, 38
Matador 78–79, 82
medicine pouch 19, 99
med kits 36
Metkayina clan 8, 17, 89, 91, 92, 97
  canoes 104–105
  clothing 99, 100
  sign language 100, 123
  village 94–95
missiles 65, 89
Mo'at 14, 29
Mons Veritatis 101

HEXBOT HEAVY

N

necklaces and chokers
  Metkayina 99, 101, 103
  Olangi 35
  Omatikaya 13, 14, 16, 17, 18, 20, 21, 23, 35
Neteyam 11, 16–17
Neurolab 49, 50–51
Neytiri 9, 11, 14–15, 98
nictitating membrane 101
nikt'syey 30

O

Olangi clan 34, 35, 104
olo'eyktan 9, 12, 96
Omatikaya clan 8, 25, 83, 91
  at High Camp 26–27
  clothing 15, 18
  crafts 18, 31
  food 30

P

Pandora 8–9
  exploitation of resources 52–53
  invasion by RDA 42–45
Patel, Dr. Max 34, 36, 38
Picador 80–81, 82
pincer fish 119
Pingers 86
Polyphemus 8
Project Phoenix *see* Recom Program

Q

Quaritch, Colonel Miles 9, 32, 41, 60, 68–69

R

RDA (Resources Development Administration) 8, 12, 13, 26, 34, 39, 41
  general technology 64–65
  invasion of Pandora 42–45
  shipbuilding 52–53
Recom (Recombinant) program 9, 32, 41, 67, 68–71
  soldiers equipment 72–73
reef fish 118–119
Ronal 9, 96, 98–99

S

Sci-Ops 48, 49
Scoresby, Captain Mick 62
SeaDragon 50, 52, 58, 62, 76–77, 78, 80, 82, 84, 123
SeaWasp 48, 86–87
Sec-Ops 48, 60, 67, 86
Skel M6-9 assault rifle 13, 27, 58
Skel Suit 48, 58–59, 61, 73
skimwing 103, 111, 116–117
Sling Load 42–43, 44, 45, 46
Socorro, Miles *see* Spider
songcord 17, 21, 22, 23, 97, 99, 100, 103
Soul Drive 68
Sound Cannon 80, 81
Spellman, Dr. Norm 34–35, 36
Spider 20, 29, 32–33
Spirit Tree 106–107, 124
sturmbeest 13, 16, 30, 35
Sully, Jake 9, 11, 12–13, 14, 26, 27, 44, 94
swarm assemblers 55, 56–57

T

tattoos
  Metkayina 96, 98, 102, 123
  Recom soldiers 70, 71
3D printing (of RDA components) 52–53, 55
tomahawk 13
Tonowari 9, 96–97
Toruk Makto 9
totems 29, 123
Tree of Souls (*Utraya Ramunong*) 106
Tree of Voices (*Utraya Mokri*) 106
tsaheylu 114
tsahik 9, 15, 96, 98, 99
tsakarem 15, 19, 98
Tsireya 21, 100–101
tsurak 97 *also see* skimwing
Tsu'tey 12, 17
Tuk (Tuktirey) 11, 22–23
tulkun 21, 97, 99, 111, 122–125
  hunting 58, 62, 63, 76–87

U

unilaron ("Dream Hunt") 20
uturu 96, 97, 98

V

visor, ikran riding 15, 16

W

Wainfleet, Corporal Lyle 41, 70–71
weaving 23, 28, 31, 34, 94, 97, 101, 103, 104, 123

Z

Z-33 pistol 60, 71, 73

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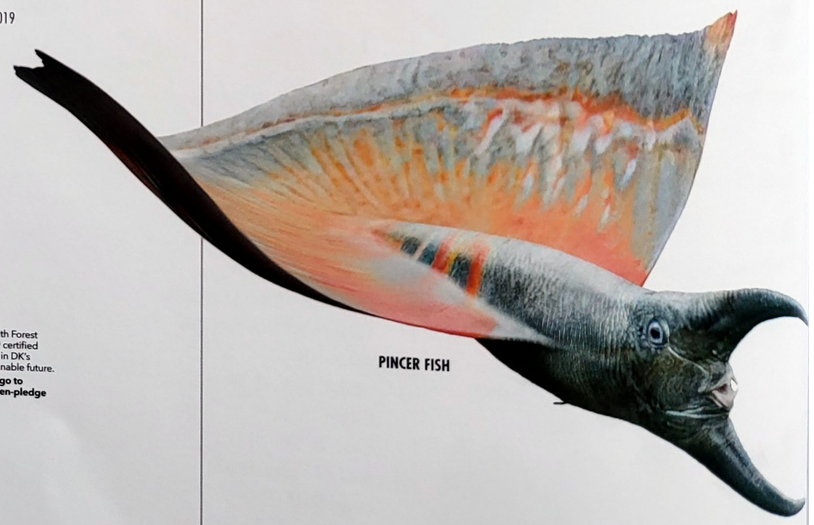

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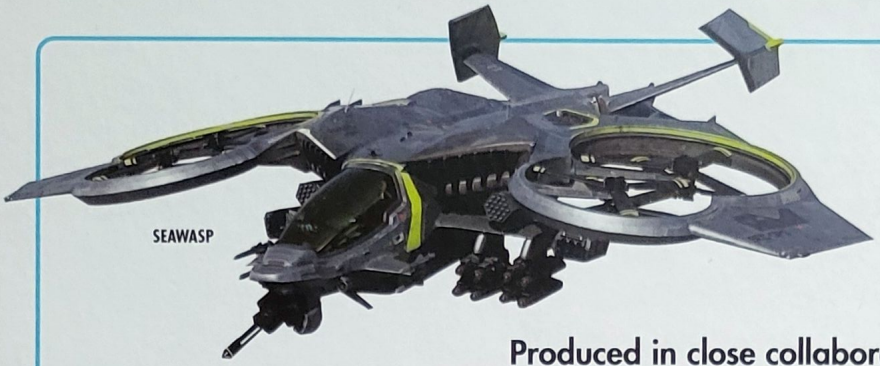

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